

#2

CD-00F74201-0-

OMB Number: 4040-0004
Expiration Date: 04/31/2012

Application for Federal Assistance SF-424

Version 02

*1. Type of Submission

☐ Preapplication☒ Application☐ Changed/Corrected Application

*2. Type of Application

☒ New☐ Continuation☐ Revision

*If Revision, select appropriate letter(s):

* Other (Specify)

Received
6/12/13

*3. Date Received:

4. Application Identifier:

5a. Federal Entity Identifier:

*5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City of Fayetteville, Arkansas

* b. Employer/Taxpayer Identification Number (EIN/TIN):
71-6018462*c. Organizational DUNS:
075657742

d. Address:

*Street 1: 113 West Mountain

Street 2:

*City: Fayetteville

County: Washington

*State: Arkansas

Province:

Country:

*Zip/ Postal Code: 72701

e. Organizational Unit:

Department Name:

Engineering and Planning

Division Name:

Engineering

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mrs.

First Name: Sarah

Middle Name:

*Last Name: Wrede

Suffix: P.E.

Title: Stormwater Engineer

Organizational Affiliation:

City of Fayetteville, Arkansas

*Telephone Number: (479) 575-8206

Fax Number: (479) 575-8202

*Email: swrede@ci.fayetteville.ar.us

Application for Federal Assistance SF-424

Version 02

9. Type of Applicant 1: Select Applicant Type: C. City or Township Government

Type of Applicant 2: Select Applicant Type:

- Select One -

Type of Applicant 3: Select Applicant Type:

- Select One -

*Other (specify):

*10. Name of Federal Agency:

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.461

CFDA Title:

Wetland Program Development Grants

*12. Funding Opportunity Number: EPA-REG6-WPDG- 2013/2014

*Title: FY13 and FY14 Region 06 Wetland Program Development Grants

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

City of Fayetteville, Washington County, Arkansas

*15. Descriptive Title of Applicant's Project:

Inventory of Riparian & Streambank Conditions of Urban Streams

Attach supporting documents as specified in agency instructions.

Application for Federal Assistance SF-424

Version 02

16. Congressional Districts Of:

*a. Applicant AR-003

*b. Program/Project: AR-003

Attach an additional list of Program/Project Congressional Districts if needed.

17. Proposed Project:

*a. Start Date: 11/01/2013

*b. End Date: 10/31/2016

18. Estimated Funding (\$):

*a. Federal	\$142,500.00
*b. Applicant	\$50,840.00
*c. State	\$0.00
*d. Local	\$0.00
*e. Other	\$0.00
*f. Program Income	\$0.00
*g. TOTAL	\$193,340.00

*19. Is Application Subject to Review By State Under Executive Order 12372 Process?

- ☒ a. This application was made available to the State under the Executive Order 12372 Process for review on 6/11/2013
☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.
☐ c. Program is not covered by E.O. 12372

*20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)

☐ Yes ☒ No

21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)

☒ **I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Mr.

*First Name: Lioneld

Middle Name:

*Last Name: Jordan


Suffix:

*Title: Mayor

*Telephone Number: (479) 575-8330

Fax Number: (479) 575-8257

*Email: mayor@ci.fayetteville,ar.us

*Signature of Authorized Representative: 

Date Signed: 6/11/2013

BUDGET INFORMATION - Non-Construction Programs

Verse 9-13-13
budget removed Indirect Chg

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. EPA-REG6-WPDG	66.461	\$	\$	\$ 142,500.00	\$ 50,840.00	\$ 193,340.00
2.						0.00
3.						0.00
4.						0.00
5. Totals		\$ 0.00	\$ 0.00	\$ 142,500.00	\$ 50,840.00	\$ 193,340.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel	\$	\$ 19,458.00	\$	\$	\$ 19,458.00
b. Fringe Benefits		6,382.00			6,382.00
c. Travel	2,976.00				2,976.00
d. Equipment					0.00
e. Supplies					0.00
f. Contractual	18,388.00				18,388.00
g. Construction					0.00
h. Other	121,136.00	25,000.00			146,136.00
i. Total Direct Charges (sum of 6a-6h)	142,500.00	50,840.00	0.00	0.00	193,340.00
j. Indirect Charges					0.00
k. TOTALS (sum of 6i and 6j)	\$ 142,500.00	\$ 50,840.00	\$ 0.00	\$ 0.00	\$ 193,340.00
7. Program Income	\$	\$	\$	\$	\$ 0.00

Authorized for Local Reproduction

OBJECT CLASS CATEGORIES WORKSHEET

A. PERSONNEL

Personnel Costs include only those that are paid through the applicant's/grantee's payroll system. They do not include paid staff of partner organizations, sub-grantees, contractors or consultants. If no Personnel Costs are identified in the budget, grantee is responsible for overseeing any contracts, consultants or subgrants entered into under the assistance agreement and for managing any equipment and supplies acquired under the assistance agreement in accordance with the applicable grant regulations.

POSITION TITLE	NUMBER POSITION	ANNUAL SALARY	WORK YEARS	PERSONNEL AMOUNT
Chris Brown		\$101,379	2	\$1,115
Sarah Wrede		\$80,829	2	\$8614
Match by state/local funds				\$
a. PERSONNEL TOTAL			\$	\$19,458

B. FRINGE BENEFITS

Costs for personnel employment other than the employees' direct income (i.e., employer's portion of FICA insurance, retirement, sick leave, holiday pay, and vacation costs) paid by the assistance applicant.

BASE: \$	+	
RATE		\$19,458
b. FRINGE BENEFITS TOTAL		X0.328
		\$6,382

C. TRAVEL

Travel is in support of eligible activities and necessary to complete the approved scope of work. The destination(s) and the number of trips planned must be necessary to complete the scope of work, and the number of travelers should be consistent with the purposes of the trip(s). International travel requires approval by the Office of International Affairs. Some international travel may require approval by the Department of State as well.

Explain: Travel expenses will be used to complete section B.4 tasks and to attend professional meetings related to the scope of the work being performed.

c. TRAVEL TOTAL

\$2,976

D. EQUIPMENT

Equipment is defined as tangible, nonexpendable, personal property charged directly to the award having a useful life of more than one year and an acquisition cost of \$5,000 or more per unit.

ITEM	NUMBER	COST PER UNIT	TOTAL
N/A			
d. EQUIPMENT TOTAL:			\$0

E. SUPPLIES

Supplies are tangible personal property other than equipment.

N/A	

e. SUPPLIES TOTAL:

\$0

F. CONTRACTUAL

Contract support is necessary to carry out the project/program objectives and that the estimated costs appear reasonable. For non-State/local recipients (e.g., non-profits, universities), see procurement requirements in 40 CFR Part 30.44; for State and local government recipients, see procurement requirements in 40 CFR Part 31.36. List each planned contract or type of service to be procured. Agreements/contract with other governmental agencies (state, local or Federal) should be listed under category h. Other.

Wetland and native plant expertise	\$15,000
Analysis of streambank material samples	\$3,388
f. CONTRACTUAL TOTAL	\$ 18,388

G. CONSTRUCTION

Construction costs are only allowable when the statutory authority includes specific language and is usually unallowable in non-construction programs except when it is a key component of a demonstration project.

N/A	
g. CONSTRUCTION TOTAL	\$

H. OTHER

Costs that not included in previously listed budget categories that are legitimately related to a proposed program or project. Examples include: printing, reproduction, postage, equipment rental, projected related expenses, etc.

WCRC budget	\$146,136
h. OTHER TOTAL	\$146,136
i. TOTAL DIRECT CHARGES: (sum of Items a. through h.)	\$193,340

j. INDIRECT COSTS: (Attach a copy of your latest indirect cost agreement)	
(RATE: %)	\$0
k. TOTAL PROPOSED COST:	\$193,340
FEDERAL FUNDS REQUESTED:	\$142,500
RECIPIENT SHARE OF TOTAL PROPOSED COSTS:	\$50,840

ASSURANCES - NON-CONSTRUCTION PROGRAMS

OMB Approval No. 0348-0040

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.


PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application. 2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives. 3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain. 4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency. 5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. 4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F). 6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. 1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), which prohibits discrimination on the | <ol style="list-style-type: none"> basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. 6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VII of the Civil Rights Act of 1968 (42 U.S.C. 3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application. 7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases. 8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. 1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds. |
|--|---|

<p>9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. 276a to 276a-7), the Copeland Act (40 U.S.C. 276c and 18 U.S.C. 874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333), regarding labor standards for federally-assisted construction subagreement.</p> <p>10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.</p> <p>11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in flood plains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).</p>	<p>12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.) Related to protecting components or potential components of the national wild and scenic rivers system.</p> <p>13. Will assist the awarding agency in assuring compliance will Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a-1 et seq.).</p> <p>14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.</p> <p>15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. 2131 et seq.) Pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.</p> <p>16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4801 et seq.) Which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.</p> <p>17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."</p> <p>18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.</p>
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<p>SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL</p> 	<p>TITLE</p> <p>Mayor Lioneld Jordan</p>	
<p>APPLICANT ORGANIZATION</p> <p>City of Fayetteville, AR</p>	<p>DATE SUBMITTED</p> <p>8/21/13</p>	

Note: Read instructions on other side before completing form.

EPA Form 4700-4 (Rev. 04/2009). Previous editions are obsolete.

EPA Project Control Number

CERTIFICATION REGARDING LOBBYING

CERTIFICATION FOR CONTRACTS, GRANTS, LOANS AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

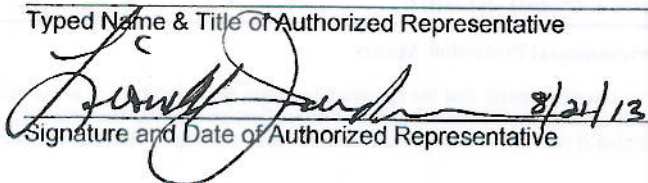
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Lioneld Jordan, Mayor

Typed Name & Title of Authorized Representative

 8/21/13
Signature and Date of Authorized Representative

City of Fayetteville Staff

	Title	Percent time	Annual Salary	Work Years	Amount	Fringe
Chris Brown	City Engineer	1.1%	\$ 1,115	2	\$ 2,230	\$ 732
Sarah Wrede	Stormwater Engineer	11.45%	\$ 9,256	2	\$ 18,512	\$ 6,072
				total	\$ 20,742	\$ 6,803

Fringe is 32.8%

Indirect is 51.9%

Watershed Conservation Resource Center Staff

	Title	Percent time	Annual Salary	Amount
Sandi Formica	Executive Director	0.25	\$100,027	\$25,007
Matt Van Eps	Associate Director	0.3	\$83,970	\$25,191
Tyler Anderson	Watershed Specialist - Engineer Intern	0.464	\$40,000	\$18,560
Larry Berry	Resource Specialist Intern	0.68	\$34,507	\$23,465

Fringe is 39.7% of salary

Indirect is 53% of salary

92,163.00

**Nonprofit Organization
Indirect Cost Negotiation Agreement**

EIN: 81-0594071

Organization:

Watershed Conservation Resource Center
380 West Rock Street
Fayetteville, Arkansas 72701

Date: December 27, 2012

Report No(s) .: 13-A-0266(10F)
13-A-0267(12P)

Filing Ref.:

Last Negotiation Agreement
dated July 27, 2011

The indirect cost rates contained herein are for use on grants, contracts, and other agreements with the Federal Government to which 2 CFR 230 (OMB Circular A-122) applies, subject to the limitations in Section II.A. of this agreement. The rates are negotiated by the U.S. Department of the Interior, National Business Center, and the subject organization in accordance with the authority contained in 2 CFR 230.

Section I: Rates

Type	Effective Period		Rate*	Locations	Applicable To
	From	To			
Final	01/01/10	12/31/10	53.21%	All	All Programs
Provisional	01/01/12	12/31/12	53.21%	All	All Programs

*Base: Total direct salaries and wages, excluding fringe benefits.

Treatment of fringe benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs; fringe benefits applicable to indirect salaries and wages are treated as indirect costs.

Treatment of paid absences: The costs of vacation, holiday, sick leave pay and other paid absences are included in the organization's fringe benefit rate and are not included in the direct cost of salaries and wages. Claims for direct salaries and wages must exclude those amounts paid or accrued to employees for periods when they are on vacation, holiday, sick leave or are otherwise absent from work.

Section II: General

Page 1 of 3

A. Limitations: Use of the rates contained in this agreement is subject to any applicable statutory limitations. Acceptance of the rates agreed to herein is predicated upon these conditions: (1) no costs other than those incurred by the subject organization were included in its indirect cost rate proposal, (2) all such costs are the legal obligations of the grantee/contractor, (3) similar types of costs have been accorded consistent treatment, and (4) the same costs that have been treated as indirect costs have not been claimed as direct costs (for example, supplies can be charged directly to a program or activity as long as these costs are not part of the supply costs included in the indirect cost pool for central administration).

B. **Audit:** All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based will be compensated for in a subsequent negotiation.

C. **Changes:** The rates contained in this agreement are based on the organizational structure and the accounting system in effect at the time the proposal was submitted. Changes in organizational structure, or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rates in this agreement, require the prior approval of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowance.

D. **Provisional/Final Rates:** Within 6 months after year end, a final rate must be submitted based on actual costs. Billings and charges to contracts and grants must be adjusted if the final rate varies from the provisional rate. If the final rate is greater than the provisional rate and there are no funds available to cover the additional indirect costs; the organization may not recover all indirect costs. Conversely, if the final rate is less than the provisional rate, the organization will be required to pay back the difference to the funding agency.

E. **Agency Notification:** Copies of this document may be provided to other federal offices as a means of notifying them of the agreement contained herein.

F. **Record Keeping:** Organizations must maintain accounting records that demonstrate that each type of cost has been treated consistently either as a direct cost or an indirect cost. Records pertaining to the costs of program administration, such as salaries, travel, and related costs, should be kept on an annual basis.

G. **Reimbursement Ceilings:** Grantee/contractor program agreements providing for ceilings on indirect cost rates or reimbursement amounts are subject to the ceilings stipulated in the contract or grant agreements. If the ceiling rate is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

H. **Use of Other Rates:** If any federal programs are reimbursing indirect costs to this grantee/contractor by a measure other than the approved rates in this agreement, the grantee/contractor should credit such costs to the affected programs, and the approved rate should be used to identify the maximum amount of indirect cost allocable to these programs.

I. **Central Service Costs:** Where central service costs are estimated for the calculation of indirect cost rates, adjustments will be made to reflect the difference between provisional and final amounts.

J. **Other:**

1. The purpose of an indirect cost rate is to facilitate the allocation and billing of indirect costs. Approval of the indirect cost rate does not mean that an organization can recover more than the actual costs of a particular program or activity.

2. Programs received or initiated by the organization subsequent to the negotiation of this agreement are subject to the approved indirect cost rate if the programs receive administrative support from the indirect cost pool. It should be noted that this could result in an adjustment to a future rate.

3. This negotiation agreement is entered into under the terms of an Interagency Agreement between the U.S. Department of the Interior and the U.S. Environmental Protection Agency. No presumption of federal cognizance over audits or indirect cost negotiations arises as a result of this Agreement.

4. New indirect cost proposals are necessary to obtain approved indirect cost rates for future fiscal or calendar years. The proposals are due in our office 6 months prior to the beginning of the year to which the proposed rates will apply.

Section III: Acceptance

Listed below are the signatures of acceptance for this agreement:

By the Nonprofit Organization:

Watershed Conservation Resource
Center
Grantee/Contractor

Signature

Matthew A. Van Eps
Name (Type or Print)

Associate Director
Title

12/19/2012
Date

For the Cognizant Federal Government
Agency:

U.S. Environmental Protection Agency
Cognizant Agency

Signature

Deborah A. Moberly
Name

Indirect Cost Coordinator

Indirect Cost Services

Title

U.S. Department of the Interior
National Business Center

Negotiating Agency

Date

DEC 27 2012

Negotiated by Mark W. Stout
Telephone (916) 566-7270

**KEY CONTACTS FORM**

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Lioneld Jordan

Title: Mayor, City of Fayetteville, AR

Complete Address: 113 West Mountain Street
Fayetteville, AR 72701

Phone Number: 479-575-8330

Payee: *Individual authorized to accept payments.*

Name: Peggy Bell

Title: Contract - Grant Financial Accountant

Mail Address: City of Fayetteville, 113 West Mountain Street, Fayetteville, AR 72701

Phone Number: 479-575-8241

Administrative Contact: *Individual from Sponsored Program Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc.)*

Name: Sarah Wrede

Title: Storm Water Engineer

Mailing Address: City of Fayetteville, 113 West Mountain Street, Fayetteville, AR 72701

Phone Number: 479-575-8206

FAX Number: 479-575-8202

E-Mail Address: swrede@ci.fayetteville.ar.us

Principal Investigator: *Individual responsible for the technical completion of the proposed work.*

Name: Sandi Formica

Title: Executive Director

Mailing Address: Watershed Conservation Resource Center, 380 West Rock Street, Fayetteville, AR 72701

Phone Number: 501-352-5252

FAX Number: (928) 396-2546

E-Mail Address: formica@watershedconservation.org

Web URL: www.watershedconservation.org

Revised
WORK Plan
9-4-13

Proposal Workplan

Section A: Cover Page

Project Title: Inventory of Riparian & Streambank Conditions of Urban Streams

Track II Application – FY13 or FY14

Core Elements: Monitoring and Assessment and Voluntary Restoration and Protection

ACTIONS: 1. Identify program decisions and long term environmental outcome(s) that will benefit from a wetland monitoring and assessment program, 2. Consider watershed planning, wildlife habitat, and other objectives when developing your selection process restoration/protection sites, 3. Develop and evaluate restoration/protection projects, and 4. Monitor restoration sites to ensure that they are implemented and managed correctly and linked to relevant watershed planning efforts.

Name of Applicant: City of Fayetteville, Arkansas, DUNS #07-565-7742

Key personnel and contact information:

Sarah Wrede, City of Fayetteville, Engineering, swrede@ci.fayetteville.ar.us, (479) 575-8208

Sandi Formica, WCRC, formica@watershedconservation.org, (501) 352-5252

Geographic Location: Fayetteville, Washington County, Arkansas; HUC: 11110103, Illinois River Watershed; HUC: 11010001, Upper White River Watershed

Total Project Cost: \$193,340, **Federal Dollars Requested:** \$142,500, **Match:** \$50,840

Abstract/Project Summary: Assessing stream systems within our urban areas provides important information to help conserve natural resources, protect water quality, and plan for urban development. The City of Fayetteville (City) in partnership with the Watershed Conservation Resource Center (WCRC) proposes to develop an inventory of the riparian condition of 20 miles of urban streams and develop streambank erosion prediction curves to estimate sediment and nutrient loadings from streambank erosion. The stream inventory will

include an evaluation of the riparian area and streambanks. Wetland features, prairies, and springs within the stream corridor will be identified. Data will be collected on streambanks showing signs of accelerated erosion and erosion rates will be measured to identify sites needing restoration and quantify sediment and nutrient loadings. Criteria will be developed and applied to prioritize sites for preservation or restoration, depending on their condition.

Hamstring, Owl, and Clabber Creeks will be included in the study and are located where there continues to be rapid development. Accelerated streambank erosion contributes excessive loads of sediment and nutrients to these streams and has been observed in this area along with exceptional natural features, such as wetlands, springs, remnant prairies, and hydric soils. Evaluation of these urban stream corridors will enhance planning efforts to preserve streams, wetlands, and aquatic/terrestrial habitats and help to minimize the impact of urban growth on existing ecosystems. The streambank evaluation will help the City to take actions to reduce NPS pollution and direct funding for streambank restoration to the most beneficial area.

Section B: Project Description: The City of Fayetteville (City) in partnership with the Watershed Conservation Resource Center (WCRC) proposes to develop an inventory of the riparian and streambank conditions for 20 miles of urban streams and develop streambank erosion prediction curves to estimate sediment and nutrient loadings from streambank erosion. The purpose of the riparian and streambank assessment is to: A) Identify areas in need of restoration and preservation; B) Develop criteria to prioritize 1) unstable streambanks for restoration, including potential for wetland restoration and 2) stable stream and wetland areas for preservation; and C) Provide information to the City's Engineering and Planning Divisions to use when evaluating proposed development that could potentially impact streams, wetlands, and springs. The inventory will include an evaluation of A) the riparian area in which wetland features, springs, and general vegetation composition will be identified and B) streambanks with accelerated erosion that includes measuring erosion rates, characterizing streambank materials, and estimating sediment and nutrient loadings

Prioritization of unstable sites for restoration will be based on sediment and nutrient loadings, location, threat to property, and presence or potential to create natural features, such as, wetlands, prairies, etc. Documentation and prioritization of the existence of natural features will help to ensure that they will not be destroyed or damaged from development. The assessment will focus on Hamestring, Owl, and Clabber Creeks, which are located in the western side of Fayetteville, where there continues to be rapid development (Section F, Att.1). These three watersheds are part of the Illinois basin and encompass an area of approximately 14 square miles. Additional streams will be identified to include in the study within Beaver Lake watershed. Beaver Lake is the drinking water source for over 450,000 NW Arkansas residents.

1. **Program Priorities: Track Two:** The proposed project falls under two Core Elements: *Monitoring and Assessment* and *Voluntary Restoration and Protection*. The action under *Monitoring and Assessment* is '*identify program decisions and long term environmental outcome(s) that will benefit from a wetland monitoring and assessment program.*' Funding will be sought to restore sites identified as unstable with poor riparian conditions to enhance habitats and improve water quality. Wetland areas and springs will be identified along with high quality headwater streams. The information and knowledge gained from the assessment will be used to help support the City's Streamside Protection Ordinance. Information on contaminant load reduction from stream restoration will be tied to the broader watershed planning efforts. The first action under *Voluntary Restoration and Protection* is '*consider watershed planning, wildlife habitat, and other objectives when developing your selection process restoration/protection sites.*' The criteria selected to prioritize sites for restoration or protection will be based on local watershed planning efforts. Both EPA accepted watershed plans for the Illinois River and Beaver Lake emphasize the need to improve water quality through riparian enhancement and preservation and reduction of sediment and nutrient loadings through streambank restoration. Both the streambank erosion prediction curves and prioritization criteria will serve as examples of assessment techniques that other urban areas can use to manage and protect their urban stream corridors. The second action is '*develop and evaluate restoration/ protection projects.*' The project results will provide the City stream/ wetland sites prioritized for restoration or protection. The third action is '*monitor restoration sites to ensure that they are implemented and managed correctly and linked to relevant watershed planning efforts.*' The City has previously partnered with the WCRC to restore three urban stream sites that include wetland features. All three sites will be monitored and maintained to ensure objectives are being met.

2. Description of Need: Over the past 30 years, Northwest Arkansas' population tripled to approximately 400,000. Both forested and agricultural lands have been converted to urban areas, increasing the amount of impervious surfaces, which has increased runoff and intensified the magnitude and frequency of high flow events in streams. This additional runoff and energy has increased channel erosion, resulting in vertical cut-banks on both City and private property. Development has also resulted in the loss of urban wetland, prairie, headwater stream, and riparian features that are connected to the stream channels and needed for healthy stream ecosystems. Conducting an inventory of the condition of 20 miles of urban streambank and riparian areas will provide information and data needed to restore disturbed sites and to preserve robust natural features. The City will use this assessment to help determine their contribution to water quality improvements in the Illinois River and Beaver Lake watersheds by restoring and protecting urban streams and wetlands. The City will become a regional example of collecting environmental data and using it to plan for urban development and natural resource protection. Prioritizing unstable stream sites for restoration based on established watershed planning goals will result in better utilization of funding for restoration and maximizes the benefits gained.

The proposed project will help the City to meet both local and regional priorities for water quality improvement and protection. Locally, the City of Fayetteville adopted a Streamside Protection Ordinance in 2011 to accomplish several goals including: reduce pollutants in waterways, preserve flood capacity, and protect the integrity of natural resources. These goals and all technical details of the ordinance were researched by staff and went through an extensive public review and comment process. The ordinance establishes streamside protection zones along streams within the City with a drainage area of 100 acres or greater. City staff reviews development plans for compliance with the ordinance, answers questions from the

public and educates City staff who work near streams. The riparian and streambank assessment will provide additional data needed to help with the Streamside Protection Ordinance.

The project also addresses regional priorities and local objectives associated with the Illinois River and Beaver Lake watersheds. Both watersheds 1) have impaired or 303 (d) listed streams or stream segments that are in need of additional data, with siltation/turbidity specified as the cause and surface erosion as the source; 2) are considered a priority by the ANRC for reducing nutrients. This project will provide scientific data and information to support actions that will reduce both sediment and nutrient loads. In addition, comprehensive watershed management plans have been developed and accepted by US EPA and include goals for water quality protection through restoration and protection of riparian buffers and streambanks.

3. Outputs, Outcomes, and Results

i. **Outputs:** The expected environmental outputs are 1) Identification , for 20 miles of urban streams, a) sites needing streambank and riparian restoration, including wetland enhancement and b) areas of stream corridor that have unique environmental attributes, such as healthy riparian forest, wetlands, springs, and/or prairie; 2) Criteria for prioritizing sites for restoration or preservation; 3) Maps showing prioritized sites for restoration or preservation to be used as a planning tool for the City and local watershed planning; 4) A set of streambank erosion prediction curves to be used at sites without erosion data; 5) Estimates of annual loading rates of sediment, T. Phosphorus, and T. Nitrogen from streambank erosion within the 20 miles of surveyed channel; and 6) Comparison of channel dimensions and summary of vegetation and maintenance at three existing urban restorations.

ii. **Outcomes:** The expected environmental outcomes are 1) Improve the decision making ability of the City and watershed planners in conducting restoration of streams, wetlands, and riparian areas within the City; preservation of healthy streams, wetlands, and other natural

features with respect to urban development; and reduction of sediment and nutrients from streambank erosion to improve water quality within the Illinois River and Beaver Lake watersheds; 2) Integrate the City's efforts of restoration and preservation of urban streams and wetlands into local watershed planning; 3) Have available for the City and watershed planners both prioritization criteria and the data/information needed to estimate contaminant loadings for the evaluation of other areas within the City; 4) Improve the ability of City staff to implement the Streamside Protection Ordinance through the data and information collected; 5) Increase understanding of City's maintenance staff and volunteers on the importance of urban streams, wetlands, water quality, native vegetation management, and maintenance at three existing urban stream restoration sites; 6) Improved stream, riparian area, and wetland protection efforts; 7) Increase understanding of healthy streams and wetland condition.

iii. Link to the EPA Strategic Plan: These outputs and outcomes are directly linked to the EPA Strategic Plan's Goal 2 – Protecting America's Water because data will be collected and analyzed to provide information on the condition of streams and wetlands to local & state government and watershed planners to restore and protect urban natural resources. This information will be used to prevent the destruction of healthy sections of stream and wetlands from urban development. Restoration efforts will be based on the results of this study, which emphasizes maximizing sediment and nutrient load reductions from streambank erosion to improve the water quality of streams within the Illinois River and Beaver Lake watersheds.

iv. Tracking Outputs and Outcomes: The seven outputs will be direct deliverables associated with the project and completed during the timeframe of the project. City engineering staff will document the City's use of the project information in the manner described in outcomes 1-4). A form will be developed in which City staff will complete whenever considering the information provided in evaluating planned development both private and

municipal, interaction with local watershed groups, and implementing the streamside protection ordinance. A questionnaire will be developed and distributed to City staff and volunteers who provide assistance in monitoring and maintaining existing restoration sites as described in Outcome 5). Outcomes 6-7) will be evaluated by recording the number of stream miles, wetland acres, and other natural features restored or preserved based on the results of this study.

4. Project Tasks The project tasks are summarized as follows:

Task 1: Development of Quality Assurance Project Plan (QAPP). A QAPP will be developed to assure that data collection activities result in quality data. The WCRC will be responsible for this task. ***Deliverable: EPA Approved QAPP***

Task 2: Conduct Inventory of Riparian, Streambank, Wetland, and other Natural Features.

Under this task, 1) In addition to the main stems of Owl, Hamestring, and Clabber Creeks, stream(s) will be identified to be included in the inventory and assessment; landowner access permission will be determined or obtained; 2) An inventory of riparian and streambank conditions for 20 miles of urban stream will be conducted that includes the following components: a) Information on the riparian area including presence of wetland features, springs, prairie, forest coverage, and vegetation composition; b) streambanks showing signs of accelerated erosion will be evaluated for their erosion potential using the Bank Erosion Hazard Index (BEHI) method and for Near Bank Shear Stress (NBSS); c) physical measurements of streambank height and length will be performed; d) the width of the riparian area will be evaluated using GIS. The WCRC will be responsible for Task 2 except the applicant will assist with identifying additional areas to include in the assessment and obtaining landowner permission where necessary. ***Deliverables: A summary of the inventory results with maps.***

Task 3: Develop streambank erosion prediction curves and estimate sediment loads from eroding streambanks. Under this task 1) Select a minimum of 24 sites for evaluation of lateral

streambank erosion rates based on the results of the inventory, install toe pins, and measure bank profiles; 2) Characterize streambank materials through sampling and analysis; 3) Following one year, measure bank profiles again; evaluate flow conditions to determine if measurements need to be collected again; 4) Develop erosion prediction curves; 5) Estimate sediment and nutrient loads from streambanks. The WCRC will be responsible for this task. ***Deliverables:*** *Maps showing erosion potential for streambanks; streambank erosion prediction curves for City of Fayetteville tributaries; estimates of sediment and nutrient loads resulting from streambank erosion and at restoration sites.*

Task 4: Develop and Implement Criteria for Prioritizing Sites for Restoration or Preservation.

Activities include 1) Criteria for preservation of riparian areas associated with wetland features, prairies, and/or stable streams will be developed and applied; 2) Criteria for prioritizing the restoration of unstable streambanks will be developed and applied. ***Deliverables:*** *Mapping products showing prioritized sites and summary of problems and/or natural attributes.*

Task 5: Integrate Study Results into City Engineering/Planning and Monitor and Maintain Existing Restoration Sites.

Activities include 1) coordinate with City Engineering & Planning staff to develop strategies for utilizing study results to a) assist with activities associated with the streamside protection ordinance; b) evaluate urban development proposals; and c) seek and budget funding for restoration; and d) develop incentives for preservation; 2) At three existing stream restoration sites a) collect stream assessment data to determine if restoration is meeting project goals and objectives; b) conduct needed maintenance associated with vegetation and hydrology. The applicant and the WCRC will work on these tasks together. ***Deliverables:*** *Summary of strategies developed and monitoring and maintenance results.*

Task 6: Technology Transfer and Outreach. Under this task 1) work with local watershed groups and planners to incorporate assessment information into watershed management efforts;

2) incorporate project information into local and regional workshops, meetings, conferences and/or courses attended by city planners, local decision makers, and/or environmental professionals; and 3) work with City staff and volunteers to remove invasive plants at existing stream restoration sites a minimum of two times each at three sites. The applicant and the WCRC will be responsible. *Deliverables: Outreach activities summary*

Task 7: Administrative and Reporting. The applicant will provide project oversight and develop

1) quarterly reports and 2) a final report. *Deliverables: Quarterly and Final Reports*

5. **Partnership Information** – In addition to the partnership between the City and WCRC, the following organizations have agreed to participate as partners and provide assistance:

Fayetteville Natural Heritage Commission will provide information on their green infrastructure study and input on the prioritization of sites for preservation.

Beaver Lake Watershed Alliance will assist in transferring information and results to their watershed planning team and to other watershed groups. They will also assist coordinating volunteers for removing invasive vegetation from existing restoration sites.

Illinois River Watershed Partnership will assist with transferring information and results to their watershed planning team and coordination of volunteers for invasive plant removal.

Arkansas Natural Resource Commission will assist with transferring project information and results to the Arkansas Multi Agency Wetland Planning Team.

Letters of support can be found in Section F, Att. 2.

6. Milestone Schedule

Milestone/Task	Start Date	End Date	Product
1: Develop QAPP	11/01/13	01/30/14	Approved QAPP
2: Conduct Inventory			
1) Finalize Site Selection	12/01/13	01/15/14	Area/watershed map

2) Conduct Inventory	02/01/14	05/31/14	Inventory results
3: Develop Streambank Erosion Prediction Curves/Estimate Loads			
1) Select Streambanks/Monitoring	05/31/14	07/31/14	Map of selected locations
2) Install Toe Pins/Measure Bank Profiles/Conduct BEHI/NBSS	08/01/14	10/31/14	Summary of data collected
3) Follow-up Measurements	09/01/15	10/31/15	Summary of erosion rates
4) Sample/analyze bank materials	10/31/14	09/01/15	Results of Analysis
5) Create plot of curves	11/01/15	01/15/16	Prediction Curves
6) Estimate sediment & nutrient loads	01/16/16	02/28/16	Summary of loadings
4: Prioritization Criteria			
1) Riparian Preservation	11/01/14	10/31/15	Map of sites prioritized
2) Stream & Wetland Restoration	10/31/15	06/30/16	Map of sites prioritized
5: Integration of Study Results & Monitoring & Maintenance	02/01/14	10/31/16	Summary of Strategies and Monitoring/Maintenance
6: Outreach	04/30/14	09/30/16	Summary of activities
7. Reporting - Quarterly Report	01/31/14	10/31/16	Progress report
Final Report	08/15/16	10/31/16	Final report

7. **Detailed Budget Workplan:** If the applicant receives an award, the sub-award/sub-grant will be properly awarded consistent with the applicable regulations in 40 CFR Parts 30 or 31. The applicant will also follow all appropriate procurement standards as required by EPA. The overall project budget is summarized in the table below. The award recipient will administer the grant and procure services. The sub-award recipient, the WCRC, will execute major project tasks associated with this proposal, because of their unique expertise in the area of natural resource inventories, watershed assessment, streambank erosion monitoring and material sampling and analysis, and development of streambank prediction curves. Their budget is shown on line "h. Other: WCRC" in the budget table below. The primary responsibilities of the WCRC

are outlined in Section B.4. The contract services include procurement of wetland and native plant expertise (\$15,000) and analysis of streambank material samples (\$3,000).

The federal, non-federal, and total cost for each project task identified in Section B.4 are as follows: Task 1. Develop QAPP (F-\$3,000, NF-\$1,000, T-\$4,000); Task 2. Resource Inventory (F-\$25,000, NF-\$19,000, T-\$44,000); Task 3. Develop Prediction Curves (F-\$65,000, NF-\$10,840, T-\$75,840); Task 4. Develop and Implement Prioritization Criteria (F-\$10,000, NF-\$5,000, T-\$15,000); Task 5. Intergrate Study Results (F-\$20,000, NF-\$5,000, T-\$25,000); Task 6. Technology Transfer (F-\$10,000, NF-\$5,000, T-\$15,000); and Task 7. Administrative and Reporting (F-\$10,000, NF-\$5,000, T-\$15,000).

Object Class Cat.	Project Budget		
	Federal	Non- Federal	Total
a. Personnel	\$0	\$19,458	\$19,458
b. Fringe	\$0	\$6,382	\$6,382
c. Travel	\$2,976	\$0	\$2,976
d. Equipment	\$0	\$0	\$0
e. Supplies	\$0	\$0	\$0
f. Contract	\$18,388	\$0	\$18,388
g. Construction	\$0	\$0	\$0
h. Other: WCRC (see table below)	\$121,136	\$25,000	\$146,136
i. Total Direct	\$142,500	\$50,840	\$193,340
j. Indirect	\$0	\$0	\$0
k. Totals	\$142,500	\$50,840	\$193,340

The applicant is providing the in-kind match and cash match (\$25,000) to successfully complete tasks described in Section B.4.

A breakdown of the WCRC budget, which is part of the total project cost of \$193,340, is shown in the table below. Travel expenses will be used to complete the Section B.4 tasks and to attend professional meetings related to the scope of the work being performed. Supplies include; Computer

	<i>Other: WCRC Budget (included in the total project cost of \$193,340)</i>		
Object Class Cat.	Federal	Non- Federal	Total
a. Personnel	\$55,000	\$11,000	\$66,000
b. Fringe	\$21,835	\$4,367	\$26,202
c. Travel	\$6,000	\$3,000	\$9,000
d. Equipment	\$0	\$0	\$0
e. Supplies	\$9,035	\$780	\$9,815
f. Contract	\$0	\$0	\$0
g. Construction	\$0	\$0	\$0
h. Other:	\$0	\$0	\$0
i. Total Direct	\$91,870	\$19,147	\$111,017
j. Indirect	\$29,266	\$5,853	\$35,119
k. Totals	\$121,136	\$25,000	\$146,136

Workstation (\$1,500), Laptop Computer (\$1,500), Surveying Supplies (\$1,000), ArcMap software license (\$2,000), Project maintenance materials including native plant seed and erosion control fabric (2,000), and rental of machinery to implement prescribed maintenance activities (\$1,035). Indirect costs are based on a negotiated rate the WCRC has established with the Department of the Interior.

8. Restoration Demonstration Project Information – N/A

9. Programmatic Capability/ Technical Experience/ Qualifications

The following staff will have primary roles and responsibilities in implementing this project.

Sarah Wrede, City of Fayetteville, Engineering Division – As Project Coordinator, she will coordinate activities within City Divisions and with the WCRC, oversee the budget, assist with integration of the study results into City activities, and project reporting. ***Chris Brown, City Engineer for Fayetteville*** – will be responsible for transferring the assessment information to the engineering, planning, and transportation departments. ***Sandi Formica, WCRC*** – As Project Manager, she will be responsible for the implementation of tasks; overall project management including overseeing the assessment; working with project partners to integrate results into watershed planning. ***Mathew Van Eps, P.E., WCRC*** – As Project Engineer, he will be responsible for overseeing the field work, data collection, and data analysis.

Applicant's Experience – The ***City of Fayetteville*** has been acknowledged for its environmental awareness for many years. The City is currently recognized as leading the State of Arkansas in sustainability and green infrastructure policies. The City partnered with the WCRC on four stream and streambank restoration projects that have been successfully implemented using the natural channel design approach. These projects included evaluating streambank erosion and creating or enhancing wetland areas. Fact sheets describing these projects can be found in Section F, Att. 3. The current administration has expressed interest and support in establishing more native grasses in the City's parks to reduce maintenance and enhance the natural settings. Additionally, the City has recently developed a city-wide phosphorus reduction plan and has restored a section of stream at Red Oak Park with the Arkansas Game and Fish Commission. The ***Watershed Conservation Resource Center (WCRC)*** is a 501(c) (3) non-profit organization whose mission is to protect, conserve, and restore natural resources. The co-founders and principals of the WCRC, Sandi J. Formica and Matthew Van Eps, have extensive backgrounds and are leading regional experts in watershed management, watershed assessment, stream

stability analysis, natural channel restoration design and the utilization of GIS for inventory and evaluation of natural resource condition. The WCRC provides specialized assistance concerning watershed resource issues to a variety of organizations including; watershed groups; local, state and federal governments; non-profit organizations; conservation districts; and other entities that request assistance. The staff has a broad range of experience with the watershed approach and has spent many years working throughout Arkansas on a variety of watershed issues. The WCRC is housed in Fayetteville, Arkansas. They have completed five stream and streambank restoration projects in the past five years and continue to monitor these projects. All of the projects include riparian, streambank erosion, and sediment/nutrient loading analyses. Fact sheets describing these projects can be found in Section F, Att. 3. A summary describing the WCRC and brief synopsis of Sandi Formica & Matt Van Eps experience along with City staff resumes can be found in can found in Section F, Att. 4.

10. Transfer of Results: Project results will be presented to key City staff personnel and meetings will be held to develop strategies to incorporate the information into current development review process and to find incentives for preservation. As part of the monitoring and maintenance of existing restoration sites, one-on-one training will be provided to City maintenance personnel and volunteers on healthy urban streams and wetlands and the removal of invasive vegetation. Events will be organized for volunteers to remove invasive vegetation. Project results will be presented to local watershed groups through local information meetings and will be incorporated into workshops, conferences and/or courses attended by city planners, local decision makers, and/or environmental professionals at both a local and regional scale.

Section C: Past Performance – The City in partnership with the WCRC has completed 95% of FY09 EPA Wetlands Program Development Grant to demonstrate the implementation of an urban stream restoration using natural channel design techniques and creating wetland areas.

The 1600 ft project has been successful in enhancing habitat, stabilizing streambanks, and protecting City Park and private property during catastrophic flooding in 2011. The City has executed four EPA State and Tribal Assistance Grants (XP-966737-01-0; XP-976902-01-0; XP-966062-01-1 and XP-966353-01-0) used for sanitary sewer line and manhole rehabilitation projects. Additionally, the City has executed three Outdoor Recreation Grants through the Arkansas Department of Parks and Tourism used for park development and improvements. All projects were successfully managed and completed within the established guidelines and timelines. All reporting requirements were met and projects resulted in satisfactory outcomes. The STAG projects resulted in reduced nutrients and reduced inflow/infiltration to the wastewater treatment system.

The WCRC has successfully completed the following EPA Section 319 grants administered under ANRC: Design and implement stream restoration using a natural channel design approach– 1200 ft Niokaska Creek at Gulley Park (2009), 1800 ft West Fork White River at Brentwood (2010), 1000 ft White River near Fayetteville (2011), and 1200 ft Mullins Creek at University of Arkansas Campus (2012). The WCRC successfully managed these projects and met all of the reporting requirements including developing a final report. Environmental outputs for all of these projects were the WCRC designed & implement a natural channel that reduced channel instability, reduced sediment and nutrient loads, and enhanced the aquatic/terrestrial habitat. Environmental outcomes were met- sediment, total phosphorus, and total nitrogen loadings were reduced by a minimum of 96%, 95%, and 94%, respectively. In 2010, the WCRC completed the EPA Agreement #AW832239-03, Mid-South Watershed Training Program in which the WCRC developed and conducted watershed-based training. The environmental output was seventeen training courses were conducted with over 700 students attending. Based on course evaluations, an outcome of over 80% of the participants found the course attended useful. A summary of WCRC projects can be found in Section F, Att. 4.

Section D: Quality Assurance / Quality Control -The applicant will be collecting environmental data and will submit a QAPP plan for review and approval. The applicant has an approved QA/QC plan.

Section E: Invasive Species Control - The applicant is not conducting activities that will result in introducing invasive species. Invasive vegetation will be removed as part of this project.

Section F: Attachments

- Attachment 1 – Project Map
- Attachment 2 – Letters of Support
- Attachment 3 – Fact Sheets on Stream Restoration Projects
- Attachment 4 – Qualifications

Proposed Stream and Riparian Inventory Areas

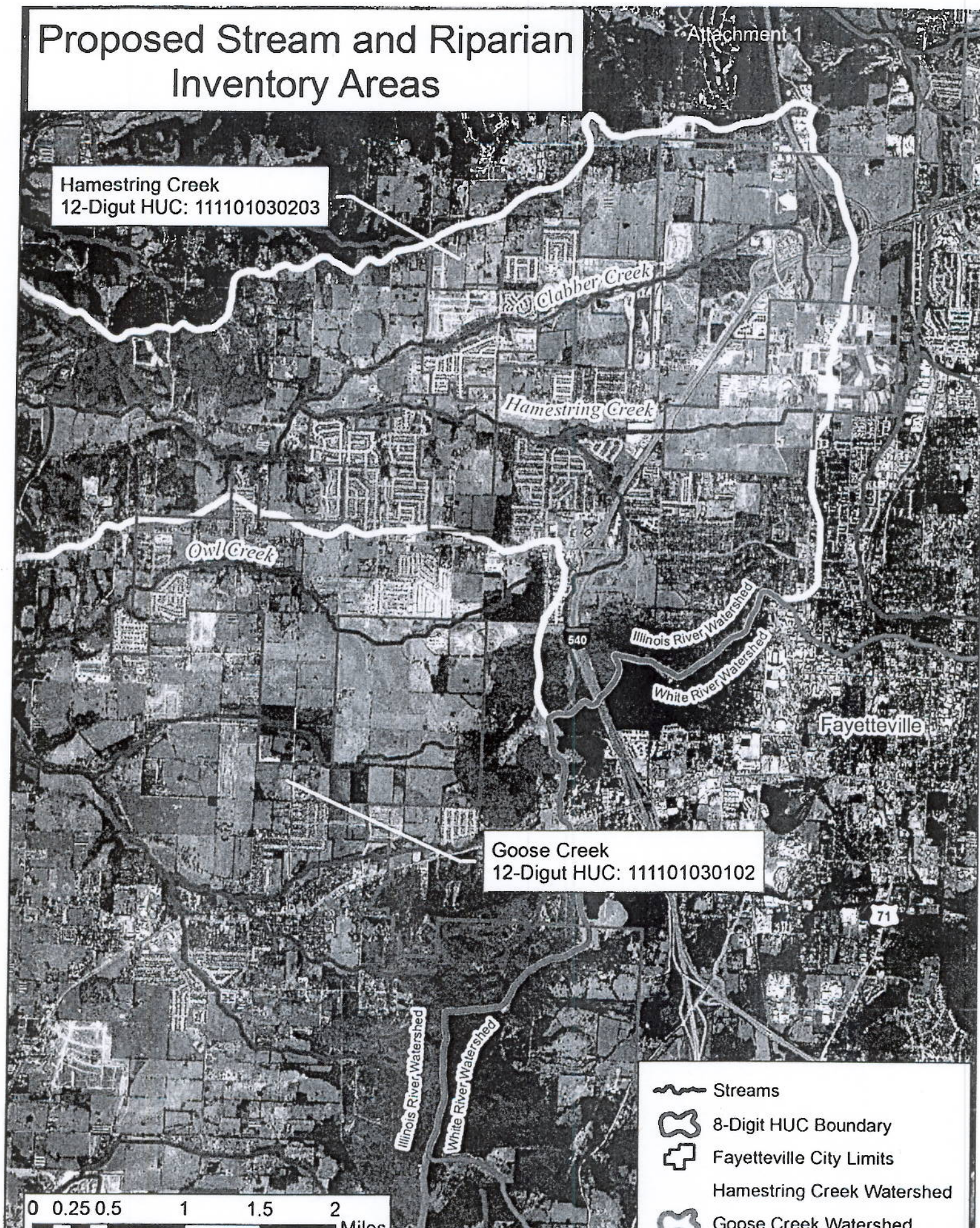
Attachment 1

Hamestring Creek
12-Digit HUC: 111101030203

Goose Creek
12-Digit HUC: 111101030102

0 0.25 0.5 1 1.5 2 Miles

-  Streams
-  8-Digit HUC Boundary
-  Fayetteville City Limits
-  Hamestring Creek Watershed
-  Goose Creek Watershed





www.accessfayetteville.org

THE CITY OF FAYETTEVILLE, ARKANSAS
ENGINEERING DIVISION
125 West Mountain
Fayetteville, AR 72701
Phone (479) 444-3443

June 11, 2013

EPA Region 6:

The City of Fayetteville has been fortunate to have the opportunity to work with the Watershed Conservation Resource Center (WCRC) and their professional staff consisting of Sandi Formica and Matthew Van Eps on numerous projects in the City, including the Gulley Park Stream Restoration, the Sweetbriar Park Stream Restoration, the Mullins Branch Stream Restoration, the White River Streambank Stabilization and the Nutrient Reduction Plan.

The WCRC team's ability to work with City staff and stakeholders, along with their technical expertise and attention to details, has made for the best stream restoration projects our City could have hoped for. Our citizens have been impressed with their outstanding work and the educational benefits these projects have provided for restoring streams into a natural state.

Based on these past successes, the City of Fayetteville and WCRC entered into a Memorandum of Understanding wherein WCRC seeks funding opportunities on behalf of the City of Fayetteville for stream restoration and other non-point source pollution reduction projects. It is through this partnership that we are applying for a grant to develop an inventory of riparian & streambank conditions of our urban streams.

The City of Fayetteville has shown commitment to the environment through implementation of the Nutrient Reduction Plan and adoption of a Streamside Protection Ordinance and recognizes the value that a stream and wetlands inventory will provide as the City grows, develops, and plans for the future. We feel this stream inventory project will provide important information which we can integrate into our Development Services review and planning processes. The inventory will also be used to inform decisions on future stream restoration projects and other capital projects.

Arkansas, and particularly the City of Fayetteville, has been very fortunate to have the services of such an outstanding professional organization in WCRC. We appreciate your consideration of this grant application so that we may continue our successful partnership with WCRC in protecting and enhancing our riparian corridors.

Sincerely,

A handwritten signature in black ink, appearing to read "JPate".

Jeremy Pate
Director of Development Services

A handwritten signature in black ink, appearing to read "Chris Brown".

Chris Brown, P.E.
City Engineer



The Fayetteville Natural Heritage Association, Inc. is dedicated to conserving natural areas of Fayetteville and its environs for the benefit of present and future generations.

June 10, 2013

US EPA Region 6,

The Fayetteville Natural Heritage Association in partnership with the Arkansas Forestry Commission Urban Forestry Program and the Beaver Water District has developed a Green Infrastructure Plan for Fayetteville and the surrounding area. This plan is being used by the City of Fayetteville as part of their 2030 Land Use Plan (Goal 5) and was presented at the 2010 EPA Green Infrastructure Workshop that was held in Fayetteville. The Plan uses riparian areas to provide essential corridors that link the larger hubs. Healthy riparian areas are a must. The Plan identified many exceptional natural features such as wetlands, springs and prairie remnants that should be preserved or restored.

Evaluation of stream corridors in Fayetteville can enhance planning efforts to preserve streams and wetlands, protect aquatic and terrestrial habitats and promote thoughtful growth. The Fayetteville Natural Heritage Association supports this grant request. The City of Fayetteville has shown that it is committed to Green Infrastructure. The results of this project will contribute to future advances.

Sincerely,

Bob Caulk
Chairman

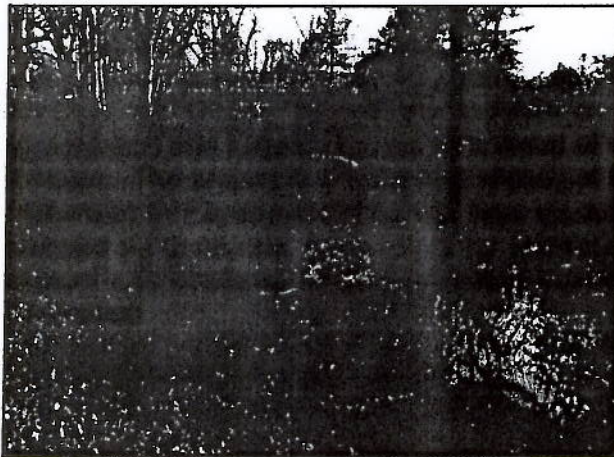
MULLINS CREEK STREAM RESTORATION

Project Partners

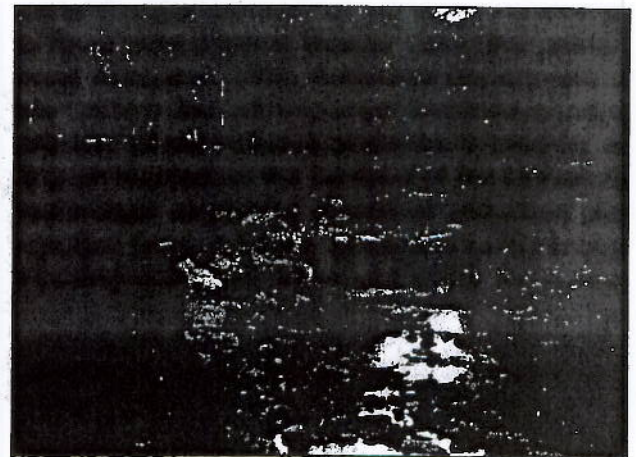
University of Arkansas
Watershed Conservation Resource Center
City of Fayetteville, Arkansas
Arkansas Natural Resource Commission
U.S. Environmental Protection Agency

The Watershed Conservation Resource Center (WCRC) worked with project partners to restore Mullins Creek. An urban stream restoration plan was designed and implemented to reduce streambank erosion and demonstrate green infrastructure techniques at a highly visible site. The project was funded by an EPA Section 319(h) grant administered by the Arkansas Natural Resources Commission with matching funds provided by the University of Arkansas and City of Fayetteville. The project was initiated in January 2011, and implementation began in July 2012 and was completed in October 2012.

Background: Mullins Creek flows to Town Branch which is a major tributary to the West Fork White River (WFWR). The WFWR eventually flows to the White River, which forms Beaver Lake, the primary drinking water source for over 400,000 people in Northwest Arkansas. The Arkansas Department of Environmental Quality placed the WFWR on the State 303(d) list of impaired waterways citing sedimentation and turbidity issues as a result of surface erosion, which includes streambank erosion, as the cause. The project is a 1000 foot section of Mullins Branch located on the campus of the University of Arkansas in Fayetteville. The site was identified for restoration as part of a nutrient reduction plan developed by Geosyntec Consultants for the City of Fayetteville. Erosion of the streambanks contribute sediment and nutrients to the waterway, potentially increasing the water treatment costs for human consumption.



Mullins Creek before restoration



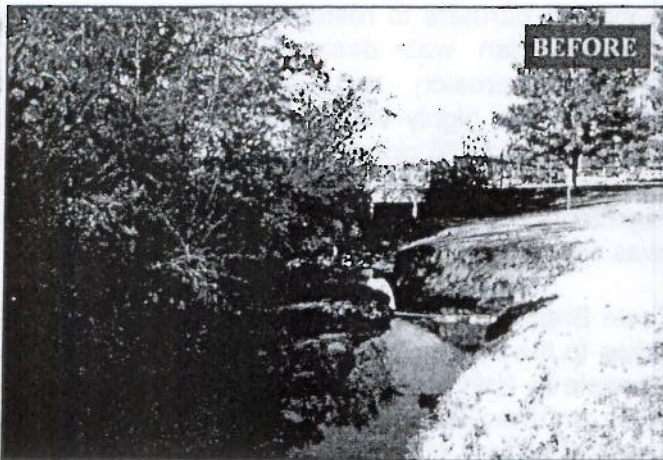
Mullins Creek after restoration

Design & Implementation: The WCRC utilized natural channel design principles to reduce streambank erosion and sediment loads. The design implementation included critically placed rock structures that deflect flow away from the banks and riffles and pools throughout the channel. Improved riffle-pool bed features increase water retention and aeration within the system, which results in better assimilation of nutrients into the environment.

The use of native vegetation was a critical component of the stabilization design. Soil mattresses, a soil layer consisting of topsoil wrapped in a coconut fiber blanket, were constructed in benches to minimize floodplain erosion during vegetation establishment. The soil layer provides a medium for plants to take root and grow and provide additional weight to secure the trees used in the structure. The soil mattresses or lifts were seeded with a mix of native riparian seed types. The stream corridor was also re-vegetated with native grasses, shrubs, and trees. As plants mature, they will help to bind the structure together through root growth to prevent further erosion. They will also aid in dissipating water velocity and act as a buffer to improve the removal of pollutants as the leaves, branches, and stems of the plants interact with runoff and rainfall events. A team of volunteers has been assembled to assess storm event damage and continue maintenance on the site as needed.

For more information on this project, visit www.watershedconservation.org or call the WCRC at (479) 444-1916.

MULLINS BRANCH STREAM RESTORATION



North end of Mullins Creek looking upstream towards Bud Walton Arena before restoration (left) and after restoration (right).



Mullins Creek before restoration where the original erosion control used was the traditional rip rap method (left) and after restoration where a natural streambank restoration design was implemented (right).



South end of Mullins Creek looking downstream towards the university's soccer complex before restoration (left) and after restoration (right).

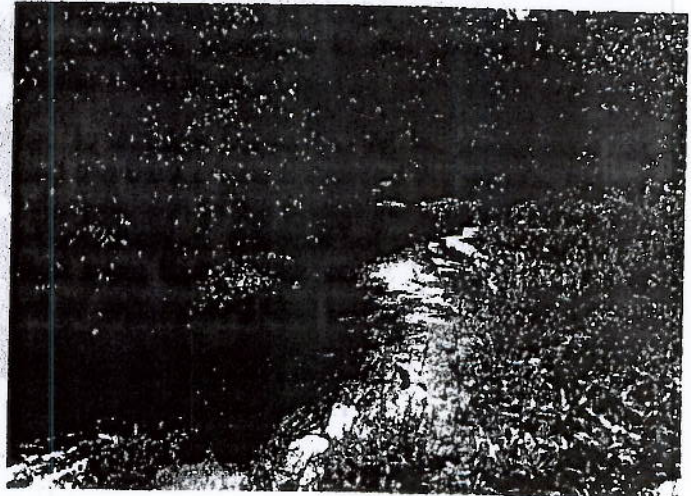
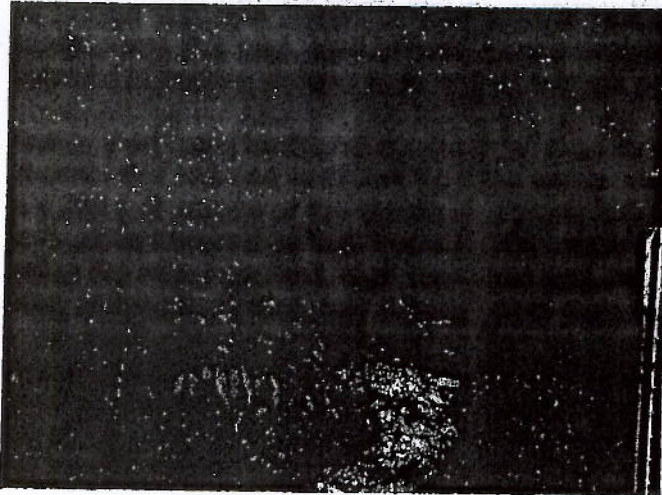
The Watershed Conservation Resource Center (WCRC) is a nonprofit organization whose mission is to protect, restore and conserve natural resources using a watershed approach. The WCRC would like to thank their project partners, University of

NIOKASKA CREEK RESTORATION PROJECT

The Watershed Conservation Resource Center (WCRC) partnered with the City of Fayetteville (City), the Arkansas Natural Resources Commission (ANRC), and US Environmental Protection Agency Region 6 (EPA) to restore a section of an Niokaska Creek that flows through Gulley Park. The stream restoration demonstration project, located in the Illinois River watershed, was funded with an EPA 319 grant, which is administered by ANRC. The City provided the required matching funds for the grant. The project was initiated in 2006 and was completed December 2008.

The demonstration project addresses the effects of upstream land use changes that have impacted the stability of the channel over the years. Increased numbers of roads and rooftops from urbanization in the watershed changed the way that stormwater runs off of the landscape resulting in higher and more frequent flows in the stream channel. The restored section of the Mud Creek tributary was incised (cut into or carved out) and previously had several vertical cut-banks, ranging in height from six to eight feet, eroding into the park land. These banks contributed excessive sediment to the stream and had the potential to destroy walking trails and undermine wastewater utility lines.

Rather than using traditional approaches, such as rip-rap, to stabilize banks, the WCRC designed a natural channel that reduced sediment from the banks, stabilized the banks, and enhanced the aquatic habitat for a 1,200 foot section of the stream that starts 200 feet downstream of the bridge on Township Road. The restoration design was built August 2008 by Elk River Construction. Bankfull benches (small floodplains) within the larger channel, rock structures that deflect flow away from banks, and defined riffles and pools were constructed. Also, four access points were created by constructing step features from native stones.

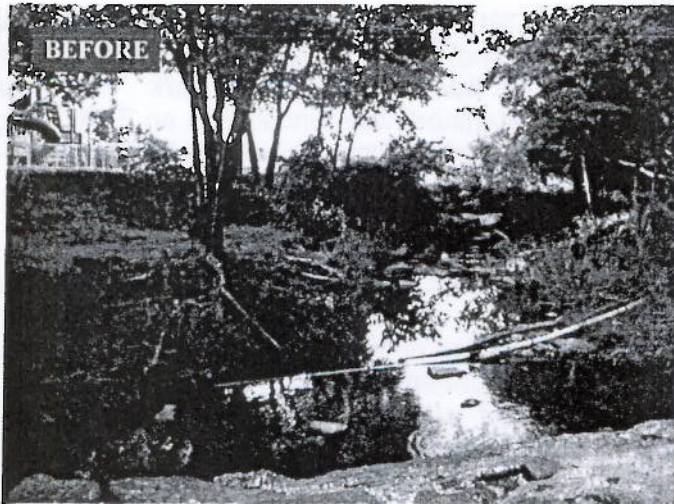


Lower section of Niokaska Creek restoration site before (left) and after restoration (right)

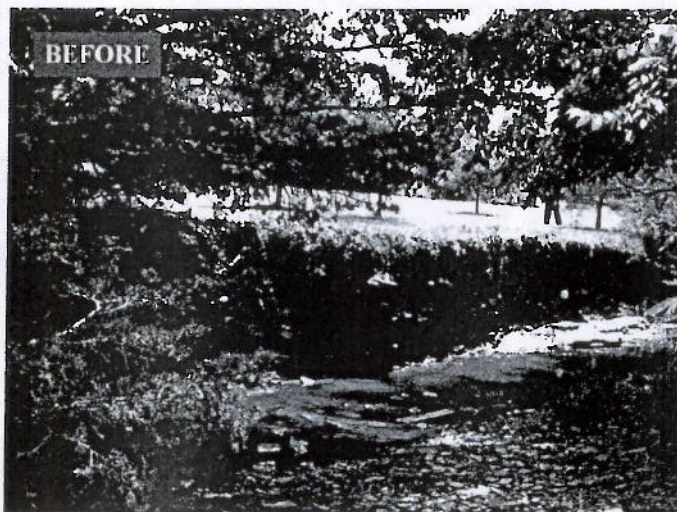
The WCRC built soil mattresses throughout the site and hand planted over 4,000 grasses, shrubs, and trees native to the restoration site during and following construction. A final planting of an additional 500 native plants was conducted involving assistance from local volunteers. Several field tours have been held for developers and city planners to have the opportunity to see alternative approaches to addressing accelerated bank erosion within urban areas. The WCRC continues to monitor and maintain the project to evaluate effectiveness and ensure the longevity of the restoration design.

By utilizing a natural channel design approach, project objectives of improving water quality and eliminating potential safety concerns were achieved while the beauty and biological function of the stream was maximized. By employing the natural channel restoration approach, the quality of our natural and water resources within the urban environment are improved for the enjoyment of the public who call Northwest Arkansas their home. For more information on this project visit www.watershedconservation.org or call (479) 444-1916. Email wcrc@watershedconservation.org for inquiries.

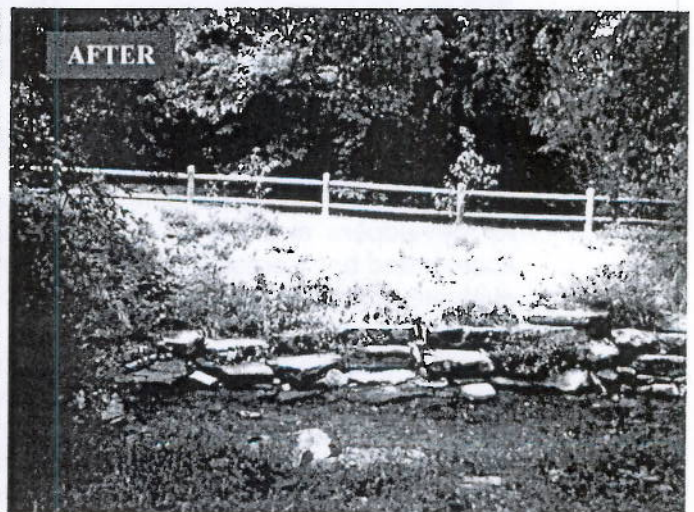
NIOKASKA CREEK RESTORATION PROJECT



Upper Section of Niokaska Creek restoration before (left) and after restoration (right)



Middle section of Niokaska Creek restoration before (left) and after restoration (right)



A safety and erosion concern before (left) and after restoration (right)

The Watershed Conservation Resource Center is a nonprofit organization whose mission is to protect, restore and conserve natural resources using a watershed approach. The WCRC would like to thank their project partners, the City of Fayetteville

SWEETBRIAR PARK STREAM RESTORATION PROJECT

The Watershed Conservation Resource Center (WCRC) partnered with the City of Fayetteville (City) and US Environmental Protection Agency Region 6 (EPA) to restore a section of Niokaska Creek that flows through Sweetbriar Park. The stream restoration project was funded with an EPA grant and the City provided required matching funds. The project was initiated in November 2009, construction & re-vegetation was completed in May 2012, and follow-up maintenance and monitoring will continue through 2013.

Background: A 1,600 foot section of Niokaska Creek that flows through Sweetbriar Park, a city-owned neighborhood park located in the Illinois River watershed, was restored. An increase of urban areas and impervious surfaces over the years has altered the hydrology of Niokaska Creek resulting in channel enlargement. Several extreme vertical cut-banks had formed at the project site that eroded as much as 10 feet per year, contributing an estimated 600 tons of sediment and 200 lbs of phosphorus annually to the stream system, and undermining the surrounding riparian area.

Design and Implementation: The WCRC utilized natural channel design principles to reduce channel instability, reduce sediment and nutrient loadings, and increase aquatic and terrestrial habitat. The design included constructing small floodplains, rock structures that deflect flow away from banks, defined riffles and pools, and wetlands in flood-prone areas adjacent to the stream. A rock structure was used to gently reduce the elevation drop that was created by a water line crossing the stream. Following construction, soil mattresses were built and the site was re-vegetated with native grasses, shrubs, trees, and wildflowers.



Niokaska Creek at Sweetbriar Park looking upstream before (left) and after restoration (right)

2011 Flooding: In April 2011, one month after construction severe weather generated a catastrophic flood event that exceeded the design flow by five times, yet the restoration project performed exceptionally well. The immature project prevented 1) 35 to 50 feet of streambank erosion, 2) the potential loss of 5% of Sweetbriar park land, 3) damage to the water line, 4) excessive inputs of sediment and nutrients from entering the stream system from erosion, and 5) the loss of 5 to 10 mature trees. Although not a single tree was lost and none of the previously occurring erosion continued, the project sustained some damage. A portion of the soil mattress was washed away and a rock sill was scoured out near the water line. The damage has been repaired and with the help of local volunteers, native vegetation was planted throughout the site. The WCRC continues to monitor and maintain the project to evaluate effectiveness and ensure the quality of the finished product.

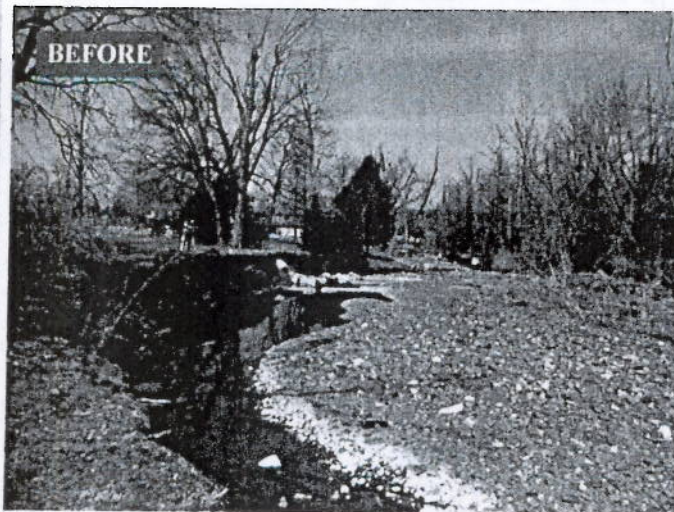
To date, the project has already prevented severe erosion and reduced potential safety concerns, while improving the beauty and biological function of the Niokaska Creek. By utilizing a natural channel design approach, the quality of our natural and water resources within the urban environment are improved for the enjoyment of the public who call Northwest Arkansas their home. For more information on this project visit www.watershedconservation.org or call (479) 444-1916.



SWEETBRIAR PARK STREAM RESTORATION PROJECT



Niokaska Creek at Sweetbriar Park looking upstream before (left) and after restoration (right)



Niokaska Creek at Sweetbriar Park looking downstream before (left) and after restoration (right)



Niokaska Creek upstream of Sweetbriar Park site looking downstream before (left) and after restoration (right)

The Watershed Conservation Resource Center is a nonprofit organization whose mission is to protect, restore and conserve natural resources using a watershed approach. The WCRC would like to thank their project partners, the City of Fayetteville

WHITE RIVER BANK STABILIZATION

Project Partners

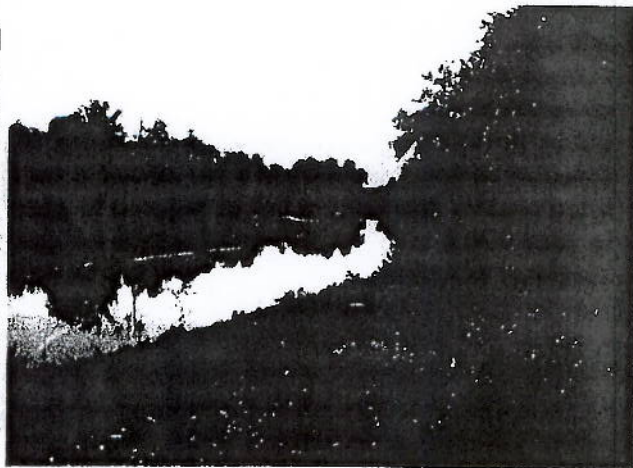
Arkansas Natural Resource Commission
U.S. Environmental Protection Agency
Watershed Conservation Resource Center
City of Fayetteville, Arkansas
CH2M Hill

The Watershed Conservation Resource Center (WCRC) worked with project partners to stabilize a riverbank on the White River near Fayetteville, AR. A stabilization plan was developed and implemented for the eroding bank which was contributing an estimated 3,600 tons of sediment per year to the White River. Beaver Reservoir is located only a few miles downstream of the project site. The project was funded by an EPA Section 319(h) grant administered by the Arkansas Natural Resources Commission with matching funds provided by the City of Fayetteville and other project partners. The project was initiated in January 2011, and implementation of the bank stabilization plan began in February 2012 and was completed in April 2012.

Fayetteville and other project partners. The project was initiated in January 2011, and implementation of the bank stabilization plan began in February 2012 and was completed in April 2012.

Background: The White River, located in Northwest Arkansas, eventually forms Beaver Lake, which is the primary drinking water source for over 400,000 people in Northwest Arkansas. The Arkansas Department of Environmental Quality placed the White River on the 1998 State 303(d) list of impaired waterways citing sedimentation and turbidity issues as a result of surface erosion, which includes streambank erosion, as the cause. The project is located on a section of the White River that remains on the impaired list in 2012. Measurement of the lateral rate of erosion at the project site stream bank indicates that the bank was retreating at a rate approximately 14 ft/year generating nearly 3,600 tons of sediment that contributes to high turbidity levels. The erosion of the riverbank also contributed nutrients to the waterway, potentially increasing the water treatment costs for human consumption.

Design & Implementation: The WCRC utilized natural channel design principles to reduce streambank erosion and sediment loads. A 'toe wood' bench was designed and constructed using large trees, boulders, and gravel. The structure known as a boulder and wood toe bench was built outward from the existing eroded bank with two distinct levels that allow flood waters to spread out resulting in lower velocity. Trees used in the structure were donated from an ongoing highway project nearby. The edge of the bench, with exposed root wads and boulders provides excellent fish habitat and also reduces the power of the passing floodwaters. A portion of the river channel was excavated to offset the lost capacity that resulted from construction of the bench.



White River Bank Stabilization project near Fayetteville, AR

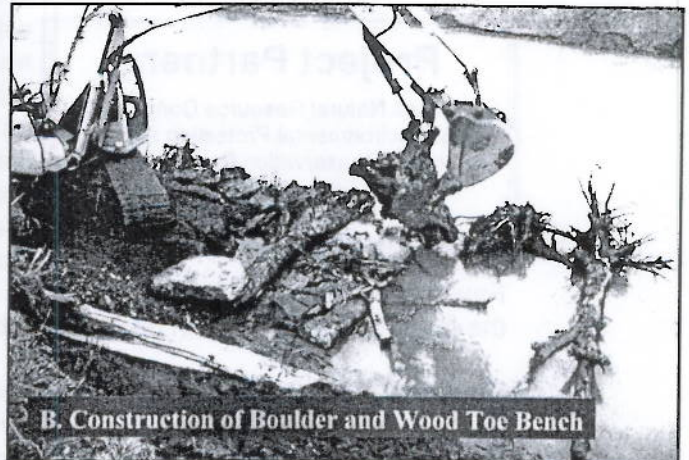
The use of native vegetation is a critical component of the stabilization design. Soil mattresses, a soil layer consisting of topsoil wrapped in a coconut fiber blanket, were constructed on top of the two benches. The soil layer provides a medium for plants to take root and grow and provide additional weight to secure the trees used in the structure. The soil mattresses or lifts were seeded with a mix of native riparian seed types. Over 700 native plants including Alder, Witch Hazel, False Indigo, Blackhaw Viburnum, and American Beauty Berry, just to name a few, were planted with help from volunteers. In addition to the potted plants, several hundreds river oat plugs, willow whips, and sycamore and button bush cuttings were incorporated into the bench. As plants mature, they will help to bind the structure together through root growth and they will also help to dissipate water velocity as the leaves, branches, and stems of the plants interact with the flooding river. An irrigation system has been designed and installed to help insure the survival of the planted vegetation during the maturation process.

Post Restoration: Although only recently completed, the stabilized bank is providing water quality benefits. A flooding rain event took place one week after the heavy construction phase of the implementation plan was completed. Inspections conducted after this flood indicated that no erosion occurred along the previously eroding riverbank. Prior to this project, the same event would have resulted in significant erosion releasing several thousand tons of sediment into Beaver Lake watershed. For more information on this project, visit www.watershedconservation.org or call the WCRC at

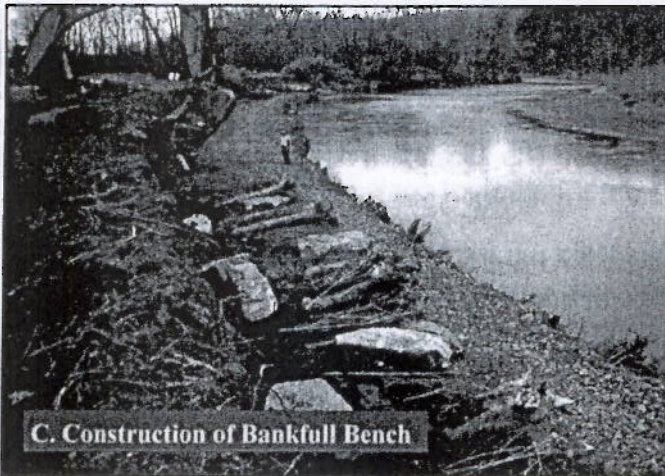
WHITE RIVER BANK STABILIZATION



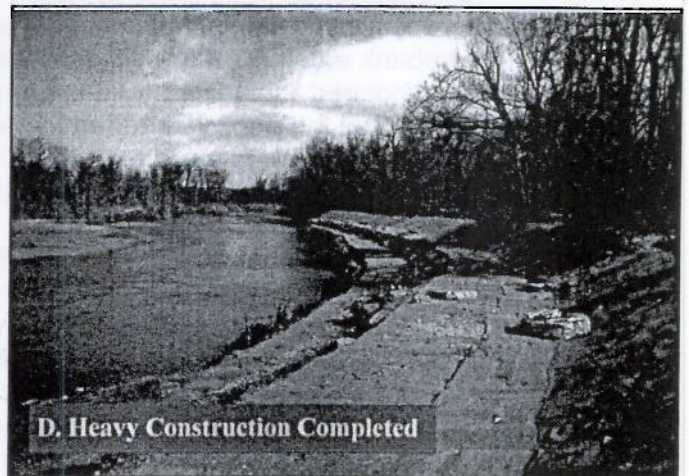
A. Before Construction



B. Construction of Boulder and Wood Toe Bench



C. Construction of Bankfull Bench



D. Heavy Construction Completed



E. Volunteer Planting Day



F. Seven Months After Construction

Clockwise from top left: A. The 16 ft tall cut-bank at the project site was eroding at an average rate of 14 ft/yr generating and estimated 3,600 ton/yr of sediment. B. The river bank was stabilized using a combination of boulders, trees, and gravel to construct a bench that slows water near the bank and improves aquatic habitat. C. Two levels were designed to protect the river bank at a variety of flow rates. D. Heavy construction activities were completed in March 2012. E. Forty volunteers helped to plant some of the 700 native plants along the stabilized bank and in the reclaimed riparian area next to the stabilized bank. F. The completed stabilization project with increasing vegetation density in September 2012.

WEST FORK WHITE RIVER STREAM RESTORATION

The Watershed Conservation Resource Center (WCRC) worked with local landowners and partners to restore an 1,800 ft section of the West Fork White River (WFWR) near Brentwood, AR. A natural channel stream restoration design was developed and implemented for the unstable section of river. The project was funded by an EPA Section 319(h) grant administered by the Arkansas Natural Resources Commission with matching funds provided by project partners. The project was initiated in 2007 and the main construction activities were completed September 2009.

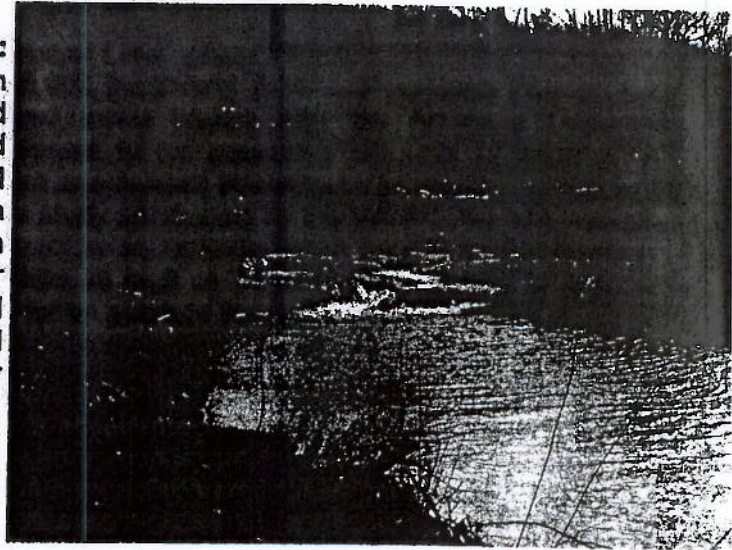
Project Partners

Arkansas Natural Resource Commission
U.S. Environmental Protection Agency
Watershed Conservation Resource Center
Arkansas Game & Fish Commission
Beaver Water District
Northwest Arkansas Land Trust
West Fork Watershed Alliance
Walton Family Foundation
Elk River Construction

Background: The WFWR is a major tributary of Beaver Lake, which is the primary drinking water source for over 400,000 Northwest Arkansas residents. Since, 1998, the WFWR has been on the 303(d) list of impaired water bodies with the Arkansas Department of Environmental Quality citing the cause of impairment to be excessive amounts of siltation. A 2004 watershed assessment showed sediment loads from accelerated streambank erosion to contribute 66% of the total sediment load for the WFWR. Based on a study conducted by the WCRC, the site was identified as a high priority for restoration. Streambank erosion measurements taken prior to implementation of the restoration design found average lateral erosion rates as high as 13 feet/year, resulting in approximately 1,960 tons/year of sediment that enters the WFWR for an average flow year.

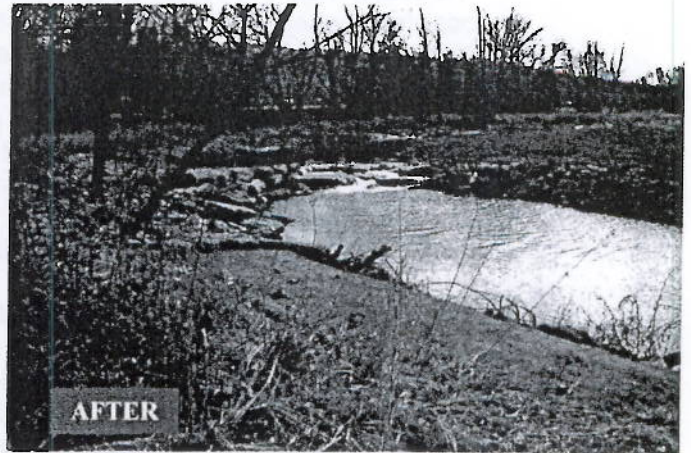
Stream Restoration Design & Implementation:

The WCRC utilized a natural channel design approach to reduce streambank erosion and sediment loads and improve aquatic and terrestrial habitats. The stream channel dimensions were designed to restore the river to a more stable form based on local reference reach data. The new channel design located the river away from severely eroding banks and eliminated abrupt bends. Structures made of natural materials were constructed to deflect higher velocity flow toward the center of the channel, reducing near-bank shear stress and minimizing erosion. The old channel was converted into a series of four settling ponds that act as ephemeral wetlands. The wetland area provides storage, habitat, and filters storm water from an adjacent West Fork White River stream restoration project at Brentwood. state highway. Following storm events, water is retained for several days as it slowly infiltrates through the soil and gravel substrate. During construction, disturbance to existing vegetation was minimized to keep mature root mass intact for additional bank stability. As the new channel was constructed, the topsoil was stockpiled and later distributed throughout the site to provide a healthy growing medium. Native plants were harvested from the project site prior to construction activities and were replanted. Sod mats, layers of soil and live vegetation taken from the fringe of a nearby pasture and placed on top of the constructed bankfull benches providing instant erosion protection and plant growth. Hundreds of native trees, shrubs, and grasses were planted and native grass and wildflower seeds were distributed to provide erosion control, improve the riparian areas, and enhance the terrestrial habitat.



Post Restoration: Several high flow events have occurred since implementation and the site has met project objectives. A catastrophic flood event occurred in April 2011 and the restoration provided protection of an access road, a residential structure, and unmarked graves at the Brentwood Cemetery, while preventing land loss and thousands of tons of sediment from entering the stream system. The project suffered some damage, and project partners contributed funding to implement repairs which were completed in December 2012. Through this project, accelerated streambank erosion has been eliminated; aquatic habitat has been improved; the riparian areas have been enhanced; and sediment loadings to the WFWR have been reduced by over 96% improving the WFWR and Beaver Lake's water quality. For more information, visit www.watershedconservation.org or call the WCRC at (479) 444-1916.

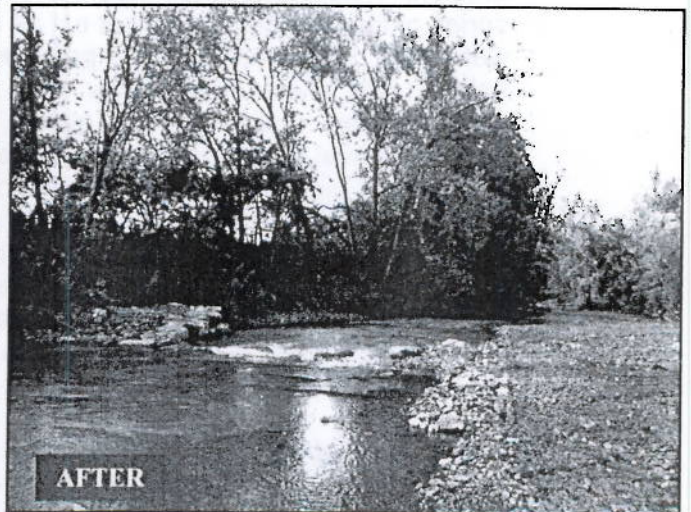
WEST FORK WHITE RIVER STREAM RESTORATION



Previous land use changes and modifications to the stream channel resulted in an unstable channel on the West Fork White River (Left). Using a natural channel design, a 1,800 ft section of the river was restored to a stable condition (right).



Prior to restoration, streambanks were eroding as much as 13 ft/yr for an average flow year (left). After realigning the river channel, a series of ephemeral wetlands were created (right) where the highest erosion rates previously occurred.



In past decades, several levees were built along the river channel preventing the river from accessing its natural floodplain. This activity resulted in stream channel degradation and accelerated streambank erosion (left). Implementation of the restoration design included perforating the old levees to provide river access to the floodplain. Also, structures

The Watershed Conservation Resource Center (WCRC) is a nonprofit organization whose mission is to protect, restore and conserve natural resources using a watershed approach. The WCRC would like to thank their project partners, the AR Natural Resource Commission, U.S. Environmental Protection Agency, AR Game & Fish Commission, Beaver Water District, NW

Sarah M Wrede
City of Fayetteville, Arkansas
113 West Mountain Street
Fayetteville, AR 72701
(479) 575-8208
E-mail: swrede@ci.fayetteville.ar.us

Professional Experience

City of Fayetteville, Arkansas
Fayetteville, Arkansas

September 2005 to present

Storm Water Engineer.

- Administer the City's Streamside Protection and Flood Damage Prevention Ordinances
- Manage the City's Drainage Criteria Manual update
- Manage the City's Phase II NPDES permit
- Implement the City's Nutrient Reduction Plan
- Design solutions for drainage problems within the City.

US Army Corps of Engineers
Omaha, Nebraska

October 2000 to May 2005

Staff Engineer. Progressed from a Coop student, to a two year internship program, and then became a staff engineer. Duties included performing hydrologic studies, dam safety surveys, construction project management, and many other duties through the rotational intern program.

Education

University of Nebraska - Lincoln
Lincoln and Omaha, Nebraska
Bachelor of Science, Civil Engineering

1997 to 2002

Professional Registration

Arkansas State Board of Licensure, Professional Engineer, No. 14719

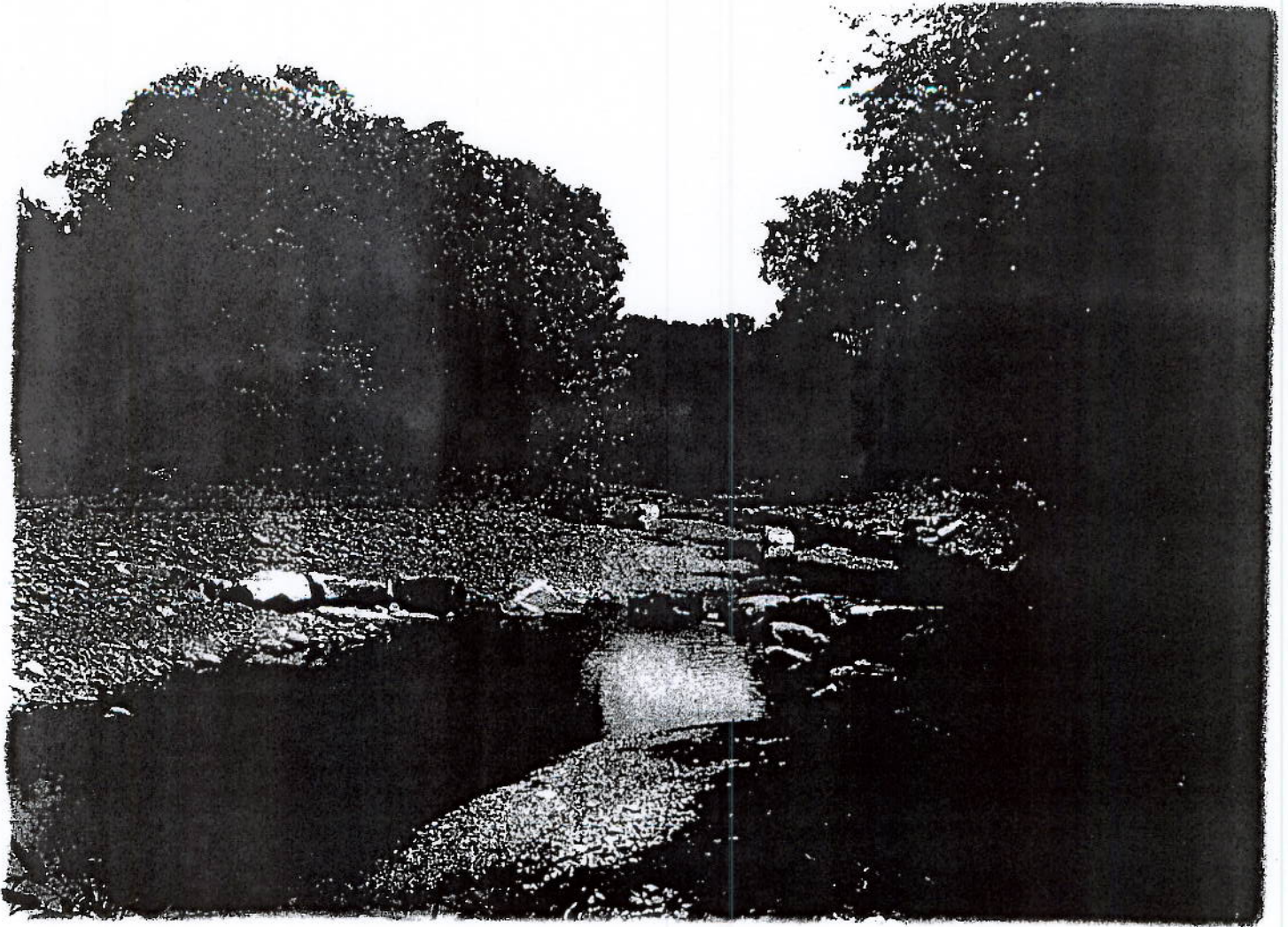
Chris Brown, P.E.

Professional Biography

Chris Brown is the City Engineer and head of the Engineering Division. As the leader of the Engineering Division, Chris oversees all activities of the Division, including review of private developments for compliance with Engineering requirements, design and management of various public works projects, land acquisition services, coordination of design and construction of the City's bicycle and pedestrian trails system, and construction inspection of both public works projects and private developments.

Chris joined the city of Fayetteville in January 2006 as Assistant City Engineer responsible for internal design, design consultant management, and construction management of the Transportation Bond Program and other public works projects managed by the Engineering Division. Prior to 2006, he was employed by the City of Springdale as the Capital Improvements Program Manager and was responsible for management of over 100 projects totaling \$175 million during his 12 years at Springdale.

Chris attended the University of Arkansas, graduating with a bachelor's degree in Civil Engineering in 1994. He has been a Registered Professional Engineer in the state of Arkansas since 1999.



2013

Stream and River Restoration Planning Services

Statement of Qualifications – Watershed Conservation Resource Center

Prepared for:



WATERSHED CONSERVATION
RESOURCE CENTER

Statement of Qualifications

Watershed Conservation Resource Center



Contents:

- I. **Watershed Conservation Resource Center Profile**
 - Overview
 - Staff Qualifications
 - Knowledge of Funding Sources
 - Presentation Experience
- II. **Stream Restoration and Other Related Projects**
- III. **References**

Attachment 1 – Project Fact Sheets

Attachment 2 – Staff Resumes



I. Watershed Conservation Resource Center Profile

Overview

The principals of the Watershed Conservation Resource Center (WCRC) recognize that safeguarding our Nation's natural resources and protecting water quality requires the will of well-organized individuals, strategic funding mechanisms, and broad community support. The foundation of any natural resource protection effort also requires technical and scientific information in order to effectively communicate the causes and consequences of environmental problems. That is why eight years ago, Sandi J. Formica and Mathew Van Eps, P.E. formed the Watershed Conservation Resource Center (WCRC), a 501(c)(3) non-profit organization that strives to protect, conserve, and restore natural resources by utilizing a watershed approach, environmental outreach and by providing planning, training, and technical assistance to landowners, communities, and government. The principals of the WCRC have extensive backgrounds and are leading regional experts in watershed management, watershed assessment, stream stability analysis, natural channel restoration design and implementation, and the utilization of GIS for inventory and evaluation of natural resource condition. They have spent decades working in Arkansas on a variety of watershed concerns including assessing sediment, nutrients, and stream instability issues in the West Fork White River and Osage Creek watersheds; evaluating impacts of off-road vehicles in the Ozark-St. Francis National Forest, and conducting stream restorations in both Beaver Lake and Illinois River watersheds. Ms. Formica, with over 27 years of experience, was previously the Chief of the Environmental Preservation Division at the Arkansas Department of Environmental Quality (ADEQ). Mr. Van Eps, a professional engineer, has over 18 years of experience that also includes working at ADEQ as a project engineer.

Committed to making a difference today, the WCRC has secured over 2.3 million dollars in federal grants and has leveraged a similar amount of local funding and in-kind services, to conduct watershed-based initiatives in Arkansas. The WCRC is recognized for its expertise in designing and implementing stream restoration plans using a natural channel design approach. Working with multiple Washington County landowners and other partners, the WCRC has successfully implemented five stream restoration projects that includes over 5,000 feet of restoration and stabilization including projects on small urban stream and large rivers in rural settings. For all of these projects, the WCRC provided project management and collected the field data, conducted the stream stability assessment, developed the restoration design along with construction drawings and specifications, obtained and coordinated construction materials, obtained required permitting and flood plain management approval, provided construction oversight, and developed and implemented site re-vegetation plans. The WCRC continues to monitor, evaluate, and maintain all of these sites. Implementation of these projects has resulted in the reduction of sediment and phosphorus loadings in the Beaver Lake



Attachment 4

and Illinois River watersheds. The stream restoration projects have protected city parks, utility infrastructure, a historic cemetery, and private property during high flow events including the 2011 flooding in Washington County. Through the success of these projects, the WCRC has been able to secure additional funding to restore additional streams, improving water quality and aquatic habitats throughout Arkansas.

The principals of the WCRC have direct experience in identifying, conducting inventories, and developing maps of problem areas of Ozark streams. They have developed and utilized watershed assessment techniques to evaluate streambank erosion and prioritize sites for stream restoration. Specifically, the WCRC worked with several local partners and landowners to develop the "West Fork Watershed Restoration of Priority Stream Reaches Project Plan," which identified 29 sites within the West Fork watershed that generate significant loads of sediment and phosphorus and are in need of restoration. The 29 sites were prioritized for restoration based on sediment and nutrient load reduction potential; loss of riparian forest buffers; river reach length; and natural and man-made features that could impact the restoration. The next step in the plan is to develop and implement sediment and erosion-reducing river restoration projects at these sites. Restoration of the highest priority site will result in an estimated sediment reduction of at least 7,000 tons per year and reduce phosphorus by at least 2,500 lbs per year. The WCRC completed the restoration of the third priority site on the West Fork in 2009, which has resulted in an average sediment reduction of 1,840 tons per year and phosphorus reduction of 450 lbs per year (See Attachment 1, West Fork Fact Sheet). In addition, wetlands were created that filter stormwater runoff and provide wildlife habitat; several acres of riparian buffer was enhanced through planting native trees, grasses, shrubs, and wildflowers and removal of invasive vegetation; and fish and other aquatic habitats were improved.

Implementing watershed-based actions and protecting water quality requires the support and cooperation of an array of local entities including landowners, government agencies, businesses, and the general public. A central component to all projects designed and conducted by the WCRC is the development of robust partnerships that encourage communication amongst stakeholders. The element of dynamic partnerships has allowed the WCRC to develop a solid technical basis to support proposed solutions to identified environmental problems. The WCRC has enjoyed working with a variety of project partners including the Cities of Rogers, Fayetteville, Fort Smith, and Little Rock; Winrock International; Arkansas Game and Fish Commission; Beaver Water District; Northwest Arkansas Land Trust; USDA National Forest Service; USDA Natural Resource Conservation Service; Arkansas Natural Resource Commission (ANRC); U.S. Environmental Protection Agency; University of Arkansas; Audubon Arkansas; the Nature Conservancy; West Fork Environmental Protection Association;



and many local landowners. The WCRC is also part of a project team to assist the City of Bentonville on reviewing and addressing a TMDL within their City.

The engineering based and not for profit nature of the WCRC provides several benefits to municipal entities interested in stream management and restoration for environmental, infrastructure, and aesthetic benefits. The WCRC can provide the technical expertise to get the job done. By being a non-profit organization, the WCRC can apply for and administer grants, alleviating the client of the administrative burden associated with grant management. Due to its size, the WCRC is also able to keep overhead costs to a minimum. Also, there are no additional costs incorporated in project budgets to create a profit margin. The WCRC has the experience in watershed and stream management including established relationships throughout the natural resources management community required to implement a successful project.

Staff Qualifications

Sandi J. Formica and Matthew Van Eps, P.E. are dedicated professionals that will provide the client the technical expertise needed to design and implement stream restoration projects using the natural channel design approach and secure grants or utilize other funding mechanisms to help finance these projects. Ms. Formica would serve as the project manager and Mr. Van Eps would serve as the project engineer. A summary of their work experience is shown below and complete resumes can be found in Attachment 2. Other WCRC staff would provide field and administrative support.

Ms. Sandi J. Formica, executive director and co-founder of the WCRC, has B.S. and M.S. degrees in Chemical Engineering from the University of Arkansas, with an emphasis on the transport of contaminants in the water, soil, and air. She oversees and manages the WCRC, an environmental non-profit organization and is responsible for project design and management, grant writing, providing technical support, and carrying-out watershed based projects. She has a proven administrative ability in the development, implementation and management of environmental programs; grant development, writing and budgeting; and establishment of working relationships with a variety of government agencies, industries and the public. She has demonstrated technical expertise in fluvial geomorphology; river stability, and stream restoration; watershed management approach; and sediment and nutrient watershed assessment. Ms. Formica has special skills of





Attachment 4

effectively communicating scientific/engineering data and natural environmental processes to non-technical audiences and coordinating stakeholders to resolve environmental issues. She is principal investigator and co-principal investigator for several projects and studies including watershed and stream assessments; evaluation of waste management systems & best management practices in protecting water, soil, and air quality; stream restoration of urban and rural systems; and development of local, volunteer-based programs which share resources to provide improved manure handling & utilization to minimize environmental impact & farmer costs. Previously, Ms. Formica worked for the Arkansas Department of Environmental Quality (ADEQ) for 12 years, her last position being Environmental Preservation Division Chief. At ADEQ, she was instrumental in implementing the watershed approach in Arkansas by working directly with local communities & natural resource agencies; initiating & chairing the Arkansas Watershed Advisory Group (AWAG) for 5 years; and coordinating watershed information programs. Ms. Formica was the 2010 recipient of the AWAG Ginger Tatom Conservation Award, which honors accomplishments performed by a professional in the field of conservation, restoration, and protection of Arkansas water resources.

Matthew A. Van Eps, P.E., is a registered professional engineer and is the Associate Director and co-founder of the Watershed WCRC. Matt has a Bachelor of Science degree in Chemical Engineering from Virginia Tech, and a Master of Science degree in Environmental Engineering from the University of Arkansas. During his professional career, he has received over 200 hours of training in fluvial geomorphology studies and has 16 years of direct experience in the field. He is the lead design engineer for several stream restoration projects that utilize a "natural channel design" approach and has been involved in stream assessments in both urban and rural settings. He has experience with the stream morphology of the streams throughout Arkansas and has made site visits to several locations in Oklahoma. His experience and training allow him to analyze existing river conditions and conceptualize potential restoration scenarios. Rounding out his watershed management and planning experience, he has been the project engineer for numerous successfully completed studies involving watershed-based assessments and evaluations of the impacts of various land-use activities on sediment and nutrient loading to watersheds. He is an occasional guest lecturer at the University of Arkansas for ecological engineering and natural sciences courses. Matt previously worked for the Arkansas Department of Environmental Quality where he was project engineer on numerous watershed-based projects including projects aimed at reducing the impacts of confined animal operations on water quality.





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Knowledge of Funding Sources

Ms. Formica has been writing, acquiring, and managing grants that fund environmental assessment and stream restoration projects since 1994. Since its founding in 2004, the WCRC has been awarded over 12 grants that have allowed entities, such as, the Cities of Fayetteville, Rogers, and Fort Smith to partner with the WCRC to conduct watershed-based assessments and stream restoration projects. These projects have provided valuable information on city planning and pollution reduction and have supported six stream restoration projects. The federal dollars acquired from these grants are approximately \$2.3 million, covered approximately 50% to 75% of the total project costs, and were obtained through a competitive process from local, regional, and national grant programs operated by entities, such as, the U.S. Environmental Protection Agency, USDA Natural Resources Conservation Service, and Arkansas Natural Resources Commission. The WCRC has been successful in obtaining grants, because of the numerous partnerships they have developed and maintained in the environmental community, which is a key element most grant programs are seeking. The WCRC has written summary documents on funding sources and requirements for stream restoration projects and is currently working with local private foundations and other entities to find support to conduct more stream restoration of priority sites on the West Fork White River to improve water quality in Beaver Lake watershed.

The WCRC is also knowledgeable in the area of stream mitigation banking and understands the potential customer base in Arkansas. The WCRC recently completed a feasibility study for Beaver Water District on establishing a stream mitigation bank in the Beaver Lake watershed to provide ongoing financial support for river restoration projects. The study included the identification of potential mitigation bank customers and the economic feasibility of establishing and operating a mitigation bank that focuses on stream restoration.

Presentation and Outreach Experience

The WCRC has extensive experience presenting and effectively communicating environmental data and information to non-technical people as well as environmental professionals. It is part of the WCRC's mission to provide outreach and education on watershed planning and stream restoration using a natural channel design approach to the general public, landowners, watershed practitioners, and environmental professionals. Ms. Formica has helped to develop and coordinate several stakeholder groups associated with watershed planning projects the WCRC has conducted or provided assistance. Also, both Ms. Formica and Mr. Van Eps have given numerous tours of and presentations on their stream restoration and watershed-based projects to citizen groups, municipalities, government agencies, landowners, and environmental professionals. They have helped to develop and coordinate volunteer efforts in planting native plants, removing invasive vegetation, and removal of trash from rivers.



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Recognizing the limited availability of watershed training in the mid-south region of the United States and through a competitive process, the WCRC was awarded a U.S. EPA national grant to address regional training needs. The WCRC created the Mid-South Watershed Training Program, which was a series of courses in Northwest Arkansas that provided environmental professionals and watershed stakeholders the scientific and technical tools needed to understand and apply the watershed approach. From 2005 to 2010, over 700 environmental professionals and watershed practitioners throughout the country attended one or more of the hands-on training courses that focused on developing comprehensive watershed plans and providing sound, scientific methods for identifying, assessing, and prioritizing water quality problems and sources of NPS pollution. Ms. Formica and Mr. Van Eps were instructors for several of the courses both in the classroom and in the field.

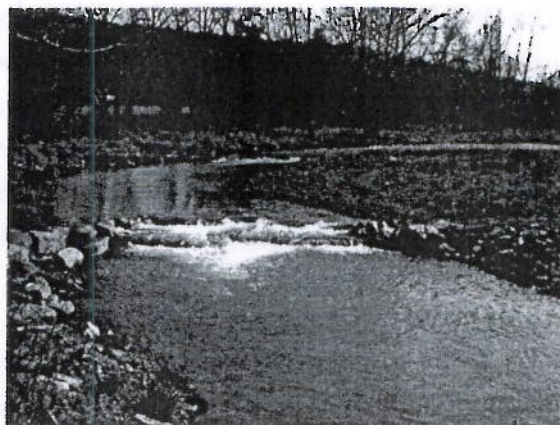
II. Stream Restoration and Other Related Projects

A summary of stream restoration and other related projects the WCRC has designed and implemented in Arkansas follows. These projects demonstrate that the WCRC has the qualifications and expertise being requested.

Restoration of West Fork White River

Washington County, Arkansas

The WCRC along with landowners and partners was awarded an EPA 319 grant from the Arkansas Natural Resources Commission to develop and implement a stream restoration design for an unstable reach on the West Fork White River (WFWR) in northwest Arkansas. The WFWR is a major tributary of Beaver Lake, which is the primary drinking water source for over 350,000 Northwest Arkansas residents. Based on a study conducted by the WCRC, the Brentwood

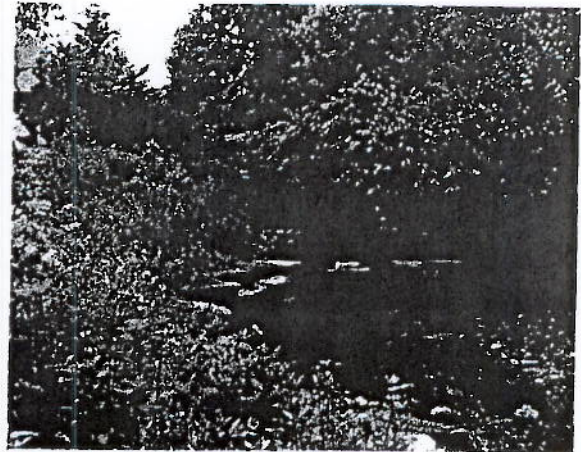


project location was a high priority site in need of restoration. The reach of river that was restored was exhibiting signs of severe lateral streambank erosion and contributed over 1,960 tons of sediment per year. The WCRC utilized a natural channel design approach to restore the impacted reach. The implemented restoration plan reduced streambank erosion and sediment loads to the WFWR. The restoration also enhances the aquatic and terrestrial habitat of the stream system. Prior to restoration, the WCRC measured streambank erosion rates to provide baseline data for evaluating success of the project. Additionally, the WCRC used a portion of the grant funding to update regional curves that are used to assess stream channel dimensions at un-gaged stream sites. The contributing watershed area at the restoration site is approximately 18 mi². The length of the restoration reach was approximately 1,800 linear feet

and involved coordination with three different landowners. Implementation of the restoration plan began in April of 2009 and was completed in September 2009. The WCRC was responsible for data collection, design development, acquisition of required permits, and all phases of implementation. The WCRC continues to monitor the site to ensure long-term success of the project by providing maintenance guidance to the affected landowners. Based on follow-up measurements, annual nutrient and sediment loads from streambank erosion have been reduced by 96%. A fact sheet showing before and after pictures can be found in Attachment 2.

Restoration of Niokaska Creek at Gulley Park, Fayetteville, AR Fayetteville, Arkansas

The WCRC was responsible for the design and implementation of a stream restoration project for a 1,200 ft section of stream that travels through an urban city park in Fayetteville, AR. Lateral erosion of streambanks in the park generated excessive amounts of sediment that was delivered to the Illinois River watershed. Also, the eroding streambanks posed safety hazards for park users and were encroaching on park infrastructure. The WCRC partnered with the City of Fayetteville (City) and obtained a U.S. Environmental Protection Agency (EPA) Section 319 grant administered through the Arkansas Natural Resources Commission (ANRC) to provide professional services to restore this unstable stream reach. The City provided matching funds for the project. A restoration design utilizing a natural channel design approach based on data from local reference reaches was developed and implemented by WCRC staff. The restoration was designed to minimize erosion, reduce sediment loads to the system, and enhance the aquatic habitat of the stream. The WCRC obtained all required permits and coordinated all implementation activities which include partnering with a nationally recognized restoration contractor to build the designed stream restoration and procurement of construction materials to be used that suit the City's aesthetic requirements. The design included a re-vegetation plan which involved planting 4,500 native plants to enhanced stream stability and the local ecosystem, while being aesthetically pleasing to park users. Since the restoration construction was completed in late August 2008, several major storm events have occurred at the site including tropical storm Ike which resulted in three times the design flow and the April 2011 flood, which resulted in five times the design flow. The stream restoration remained effective through each of the events and it is estimated that the project prevents a minimum of 100,000 lbs/year of sediment from entering the stream system, while protecting park and utility infrastructure. The WCRC continues to monitor the





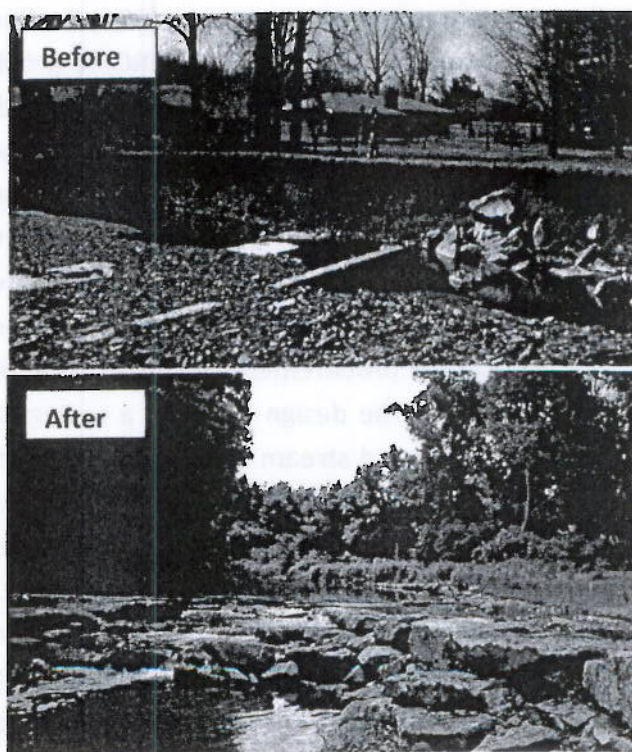
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site to ensure that the restoration remains successful into the future and to provide guidance to the City for any maintenance that may be required. The project cost was \$262,000, which included two years of maintenance costs. A fact sheet showing before and after pictures can be found in Attachment 2.

Restoration of Niokaska Creek at Sweetbriar Park, Fayetteville, AR Fayetteville, Arkansas

The WCRC was responsible for the design and implementation of a stream restoration project for a 1,600 ft section of stream that travels through private property and Sweetbriar Park in Fayetteville, AR. Lateral erosion of streambanks in the park, exacerbated by an exposed water line and concrete weir, were generating excessive amounts of sediment that was delivered to the Illinois River watershed. The most aggressive eroding streambank associated with the water line also posed safety hazards for park users, and further erosion along the water line threatened City infrastructure. Prior to the restoration implementation, the erosion on this bank was 11 feet in 2010. The WCRC partnered with the City of Fayetteville (City) and obtained an EPA Region 5 Wetlands grant to restore this unstable stream reach. The City provided matching funds for the project. A restoration design utilizing a natural channel design approach based on data from local reference reaches was developed and implemented by the WCRC staff. The design included constructing small floodplains, rock structures that deflect flow away from banks, and defined riffles and pools. Wetland areas were also constructed in flood-prone areas adjacent to the stream. The WCRC developed the stream restoration design and construction bid specifications, obtain required permits, coordinated delivery of construction materials, oversaw construction, and developed and implemented the re-vegetation plan. The project site lies in the Springfield Plateau Ecoregion and during pre-settlement times, the immediate area was most likely a tall grass prairie ecosystem. The re-vegetation plan encouraged the growth of native plants, reduced soil erosion, and improved the removal of pollutants from stormwater runoff.

The project was constructed in March 2011 and is helping to demonstrate natural





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channel design stream restoration that enhances the local ecosystem within an urban environment. Benefits of the project include:

- The restoration design helps to dissipate energy from stormwater runoff; thereby, reducing streambank erosion. The water quality of Niokaska Creek and the Illinois River is improved by reducing sediment and nutrient annual loads from the project site by over 80%.
- The buffer improvements and the establishment of wetlands along the stream enhance the infiltration of rain water, help to remove pollutants, and reduce stormwater runoff.
- The stream restoration provides distinct riffle-pool bed features, which will help to increase water retention and aeration resulting in better assimilation of nutrients.
- The channel was restored to a natural hydrology and channel enlargement has been reduced resulting in enhanced aquatic and terrestrial habitat.
- The aesthetics of the park and safety issues have been improved.
- The site provides education opportunities for alternative design methods to address urban stream erosion with a focus on ecological restoration, enhancement, and sustainability.

The major construction was completed late March, 2011. The project was effective in protecting both park and private landowner property along with the water line during the catastrophic flooding in April 2011 and the additional flooding that has occurred in May, though some damage to the project itself occurred. The WCRC will continue to monitor the site to ensure that the restoration remains successful into the future and to provide guidance to the City for any maintenance that may be required. The total project cost will be \$317,000, with 75% coming from an EPA grant source.

West Fork White River Watershed Restoration of Priority Stream Reaches Project Plan Northwest, Arkansas

The West Fork White River (WFWR) is a major tributary of the White River and is located upstream of Beaver Lake, the primary drinking water source for Northwest Arkansas serving over 350,000 residents. Based on a 2004 watershed assessment, the West Fork contributes an estimated 36,000 tons of sediment a year to the White River and 66% is from accelerated streambank erosion. In 2005, the WCRC was awarded a Conservation Partnership Initiative (CPI) grant through the USDA Natural Resources Conservation Services to develop a plan to reduce accelerated streambank erosion in the West Fork White River (WFWR) watershed. The WCRC worked with local partners and stakeholders to develop the "WFWR Watershed – Restoration of Priority Stream Reaches Project Plan." During the planning process, sections or reaches of the WFWR that were in need of restoration were identified and prioritized for restoration. Also, education and outreach to local landowners and the general public on the



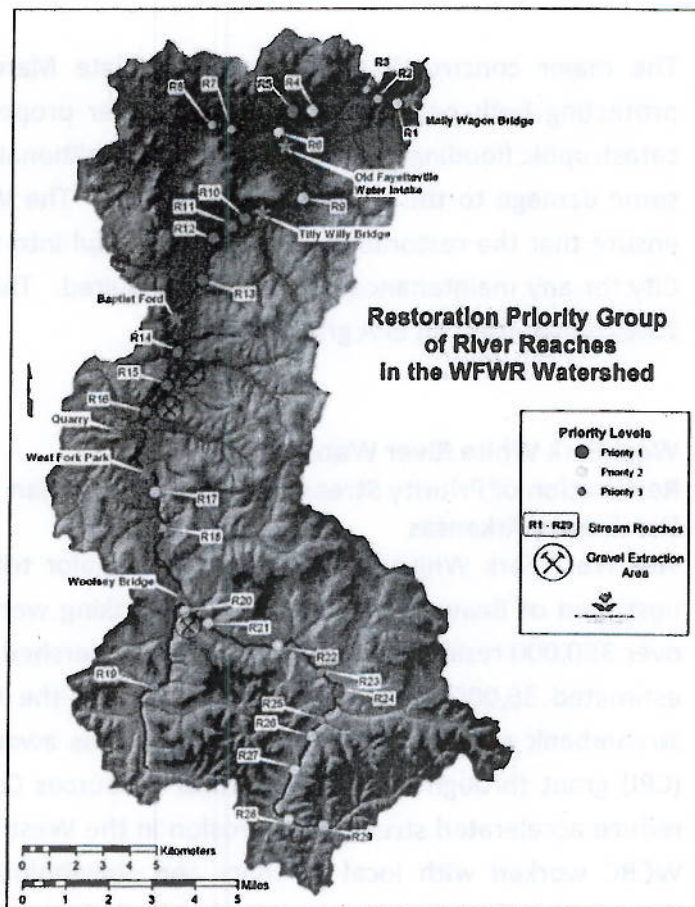
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causes and environmental consequences of stream instability and potential solutions for addressing accelerated streambank erosion was provided.

The WFWR Watershed – Restoration of Priority Stream Reaches Project Plan provides a strategy to address accelerated streambank erosion within the WFWR watershed that is degrading water quality and destroying riparian areas and aquatic habitat. The primary objectives of this plan are to:

- Provide a prioritized list of unstable sections of river (or reaches)
- Present natural channel design restoration techniques that
 - Reduce streambank erosion rates
 - Reduce sediment and nutrient loadings and improve water quality
 - Improve aquatic habitat and fisheries
 - Improve riparian areas along with terrestrial and wildlife habitat
- Estimate restoration costs along with other resource needs
- Identify potential funding sources to restore unstable sections of the WFWR

The watershed-based plan is being used as a guide to select sites for stream restoration projects and to direct resources and funding within the WFWR watershed. Since the planning process was initiated, over \$1 million of funding has been secured to restore priority sections of the WFWR. At this time, the third priority site has been restored, the second priority site has been funded for design and implementation, and a river restoration design for the first priority site has been developed.





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Stream Mitigation Banking for the Beaver Lake Watershed Northwest Arkansas

The Beaver Lake Watershed Protection Strategy lists addressing streambank erosion and improving riparian buffers as a priority for reducing sediment and nutrient loads delivered to Beaver Lake. The WCRC has demonstrated that the implementation of stream restoration projects using a natural channel design approach can reduce thousands of tons of sediment and hundreds of pounds of phosphorus annually to our water resources. But, securing funding for to restore unstable river sites is a challenge and most likely will require several funding sources. The Beaver Water District contracted with the WCRC in 2010 to conduct a feasibility study to explore using stream mitigation banking to fund stream restoration in the WFWR and other tributaries of the Beaver Lake watershed. The WCRC provided an overview of the compensatory stream mitigation program managed by Section 404 of the Clean Water Act. The study also included evaluating the economics and the environmental benefits of establishing a stream mitigation bank and how it could be used to fund additional stream restoration projects. Potential customers in need of purchasing stream mitigation credits were also explored. Through work on this project estimated mitigation credit needs within the Elk River watershed have been identified.

Sediment and Nutrient Evaluation of Blossom Way Branch Rogers, Arkansas

As part of an EPA 319 project, the City of Rogers, AR selected the WCRC to assess watershed conditions for sediment and nutrients and evaluate streambank erosion occurring in the Blossom Way watershed, a rapidly urbanizing watershed within the Illinois River basin. As part of this project, the WCRC conducted a detailed land use analysis using "heads-up" digitizing. The results of the land-use analysis were used to determine impervious surfaces and to estimate sediment and nutrient loads. The WCRC also developed streambank erosion prediction curves for the Osage Creek watershed. This included evaluating over 400 individual streambank; monitoring erosion rates for selected streambanks; and sampling bank materials to determine particle size distributions and nutrient concentrations. The streambank erosion prediction curves were used to estimate sediment and phosphorus loads from eroding streambanks and load reductions that would be achieved from implementation of stream restoration projects. Using information from the stream inventory, priority sites restoration and conservation were identified and presented in the final assessment report. The WCRC also identified sources of nutrient and sediment from the various land uses in the Blossom Way watershed. Load contributions from identified sources were estimated using GIS data, other available data, published export coefficients, and simple to complex models or relationships. The results of this project are being used by the City to help with urban planning that promotes



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aesthetically pleasing greenways; excellent water quality; and preservation and restoration of habitat.

III. References

Stream Restoration of West Fork White River

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Stream Restoration of Niokaska Creek at Gulley Park and Sweetbriar Park

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Parks and Recreation

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Chris Brown, City Engineer

City of Fayetteville

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Priority Stream Reaches Project Plan

Walt Delp, State Engineer

USDA NRCS

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Sediment and Nutrient Evaluation

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